

# THE IRON AGE

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## The Unseen Business Revolution

Powerful Human Forces Are Working to Change  
the Entire Industrial System of America—An  
IRON AGE Interview with George M. Verity

**C**HANGES have come about in business in the last 25 years that everyone vaguely realizes. Improvement in the relations of employer and employee has been marked. The feeling that Big Business is the worst enemy of the ordinary man is well on the way toward thorough dissipation. Corporation baiting is no longer an issue. There have been other notable advances in the relation of business to the everyday life of our population.

Learning that George M. Verity, president of the American Rolling Mill Co. and an outstanding representative of the new order in business, had been giving particular thought lately to the progress of human affairs in the business world, THE IRON AGE has obtained from him some observations on the silent business revolution.

"I doubt if the average citizen realizes what a marvelous transformation has been brought about in the last two generations," said Mr. Verity. "We have to go back less than two generations to find that practically all large business institutions were owned and controlled by a comparatively few individuals. Their business standards, as we view them today, needed much reform. When the corporate form of business structure came into wide usage, following the period of financial confusion lasting from 1865 to 1890, this new form of control brought about many abuses. Business practices were indulged in that would not now be tolerated by institutions similarly situated.

"One of the outstanding results of this condition of restricted ownership and of unsound policies was the creation of a very considerable antagonism between the masses of our people and business that assumed any considerable proportions.

"But today there has been unquestionably a complete reversal of the whole situation.

### 15,000,000 Shareholders

"THE corporate business of the country is largely owned by great numbers of individual stockholders. In 1900 there were 4,400,000 stockholders in our corporations. In 1923 there were 14,400,000 stockholders owning \$71,479,464,925 worth of securities in our corporations. Several million more must have been added in the last two years, making a total increase of over 250 per cent in 25 years.

"When you consider that there are only 24,350,000 families in the United States you can see what a large proportion of our people are now interested in the organized business of the nation.

"The number of stockholders in many large companies, such as the telephone and telegraph, have increased three times in the past seven years, and all companies authoritatively surveyed have increased at least twice. The stocks and other securities of a very large proportion of the outstanding business institutions of the nation are, under modern methods of organization and operation, now available to anyone who cares to buy them."

Here Mr. Verity referred also to a recent magazine article by Hon. David F. Houston, giving a description of the growth of employee ownership of stock, and then took up the question of business ethics.

### The Ethical Angle

"TO my mind," he said, "it is morally certain that, unless there had been a radical change in the ethical standards and mutual interest policies of com-

### Over 15,000,000 Now Own Corporate Shares

*There are 2,611,000 stockholders in our gas companies.*

*966,000 individuals own securities in our railroads.*

*The American Telephone & Telegraph Co. has 363,000 names on its stockholders' list.*

*The Westinghouse Electric & Mfg. Co. has 279,186 stockholders.*

*The United States Steel Corporation had 179,090 stockholders in 1923.*

*There are 66,097 stockholders in the General Motors Corporation.*

*The American Rolling Mill Co. has 10,000 stockholders.*

merce and industry over and above what they were 25 years ago, there never could or would have been such a marvelous development of the stockholding partnership relation that now exists in the large business structures of the country, which represent such a gigantic scheme of cooperation between our people and the organized business of the nation.

"If we go back to the very beginning of things we find that the people of the world were divided into two classes—masters and slaves. As civilization, commerce, and industry evolved through the centuries behind us, we reached the last century with a very autocratic, domineering and largely individual ownership of industry. Those were the days of hire and fire and of every fellow for himself.

"The modern corporation provides a means for bringing together the accumulated savings of the people and of concentrating them behind the processes of production. Lower costs are secured and the people themselves are thus provided with many things not heretofore obtainable, due to the higher costs of cruder methods.

"What has been the most outstanding and profitable result of the new order of things? The giving of the human element in business a new relation and a new and greater incentive for worthwhile accomplishment.

"This great evolution in the ethics of business has brought management and men closer together. It has brought innumerable thousands of interested partners into business who, through their combined financial

strength and their cooperation in the production, distribution and consumption of products, have made the well managed corporations of our day a great public asset.

"The economic value of mass investment, of mass effort, of mass production, and of mass cooperation, has enabled our cooperative institutions as now established to make available to the humblest worker things, the comparative possession and enjoyment of which were just a very short time ago available only to the individual of large means.

"The new ethical standards of industry today concede and demand good homes, full of opportunity for the development of the family, morally, spiritually, educationally, socially, and recreationally. They provide for the worker the best possible wages, good working conditions, a chance for promotion, and every opportunity to contribute of his best in the joint interest of stockholders, employees, customers—a fair deal to each and all.

#### New Requirements

"THE requirements of modern business are exact. Standards have unquestionably been raised and, as far as the larger cooperative activities of the nation are concerned, they who do not now recognize these

changes and adapt their policies to the needs and standards of the time are certain to face defeat. Only the more worthy can hope to survive the larger, sterner and more exacting demands of modern organized business, with the community so rapidly becoming the owner and also the one to be satisfactorily served."

George M. Verity, President American Rolling Mill Co., Middletown, Ohio, Thinks that the Radical Change in Ownership of Corporate Securities in Recent Years Is a Wholesome Trend



## Corporation Deficits in 1923

### Forty Per Cent of Incorporated Companies Showed Losses—One-Fourth of Net Income Paid in Taxes

Forty per cent, or 165,594 out of 398,933 corporations in the United States, failed to make a profit in 1923 and showed deficits aggregating \$2,014,000,000 according to a report on "Cost of Government in the United States" by the National Industrial Conference Board, 247 Park Avenue, New York. The proportion of those showing losses was highest in the mining and quarrying group of corporations, amounting to 72 per cent. In manufacturing, nearly 37 per cent of the companies ran behind; in construction, 35 per cent; and among transportation and public utility companies, 32.4 per cent.

More than a fourth (27.7 per cent), or \$2,572,000,000, of an aggregate net income of \$9,269,000,000 reported in 1923 by American incorporated businesses was paid out in taxes to Federal, State and local governments, exclusive of special assessments or betterment levies. Their total tax bills represented a sum equal to 2.2 per cent of their gross receipts, 3.5 per cent of their net assets, and 61.7 per cent, or nearly two-thirds, of the amount paid to their stockholders in cash dividends, which was \$4,169,000,000 in that year.

Manufacturing companies paid \$986,000,000 or 38.4 per cent of the total of \$2,572,000,000 in Federal, State and local taxes which came from corporations in 1923; 24.3 per cent came from transportation and public utility companies; 5.1 per cent from mining and quarrying companies; 0.9 per cent from construction companies.

Manufacturing companies paid in taxes a combined sum equal to 22.4 per cent of their net income in 1923; mining and quarrying corporations, 93.3 per cent; construction enterprises, 25.2 per cent; transportation and public utility companies, 33 per cent.

All corporations, taking the fair value of their net assets as reported for capital stock tax purposes as the approximate net investment of stockholders, earned in 1923, 9.1 per cent on their investment after deducting all taxes, while cash dividends distributed to stockholders constituted 5.68 per cent upon their investment, according to the conference board's analysis.

### To Resume Bethlehem Merger Hearing Soon in Washington

WASHINGTON, Feb. 23.—The Federal Trade Commission, it was announced today, has not set a definite date for resuming hearings in the Bethlehem Steel Co. merger case. It was said, however, that they will be held here and that they will mark the closing of the commission's side.

# Gain In Employee Ownership

Trend Toward Ownership of Corporation Securities by Workers and Customers Regarded as Logical and Wholesome—Day of One-Man Business Is Past

OWNERSHIP of great corporations by employees and by the public the corporations serve is superseding and will continue to supersede the old system of individual control of a multitude of small industries, said George E. Roberts, vice-president of the National City Bank, New York, in a paper presented before the American Institute of Mining and Metallurgical Engineers in New York last week. "The day of the one-man business is past," he said, and added that he thought it was properly past; that the large organization could, in most cases, serve the public better than the widely scattered small concerns which formerly made up our industrial system. The competitive conditions which exist in modern industry, he said, the same conditions which supply the greatest incentive to industrial progress by the constant pressure toward lower costs and larger markets, constitute a constant pressure forcing industry into larger and larger molds, under one management.

"The business of the country is coming more and more to be done by large corporations," he continued. "This being accepted as the future trend of industry, it follows that the savings of the people must be invested in the shares of these corporations instead of in the ownership of a multitude of small industries as formerly. It will require no stretch of theory or imagination to foresee these great organizations for production, transportation and distribution owned by their employees and by the public they serve and the gradual development of a higher stage of cooperative society."

Such a control by the wage-earning class, said Mr. Roberts, is both desirable and inevitable but must be reached by slow and sound economic development rather than makeshift plans based on insufficient experience with plans of employee-control. Eventually, he said, it infers a much wider knowledge of the problems of financing and managing a business on the part of workers than is at present discernible in wage-earning ranks.

J. M. Shore, editor *Service Talks*, the house-organ of the Philadelphia Rapid Transit Co., Philadelphia, pointed out how well the plan of employee ownership works out in that company. The largest block of stock in that company owned by any individual is controlled by the trustees of a voting block owned by and under the supervision of the workers employed by the company. Roughly one-third of the \$30,000,000 capital stock of the company has been bought by employees under the so-called Mitten plan and these shares are voted as a unit by duly elected trustees. It may be a surprise for the public to learn that the street car conductors and motormen actually own the controlling interest in one of the largest public utility corporations in the country.

Thus far, the management has found that the plan works out to the complete satisfaction of all concerned. It has proved so successful that the employees are still investing, on the average, \$2,000,000 of their wages annually in the stock of the company, buying the securities in the open market and adding it to their present shares.



GEORGE E. ROBERTS

The management, on the other hand, is so satisfied with the way in which the workers back up the policies of the company, after those policies have been properly explained and studied, that the same system is now being placed in effect in other cities where the Mitten system of management is used. The employee ownership plan used by the Philadelphia Rapid Transit Co. has been called "the first Soviet in America," said Mr. Shore, but it is very far from being an impractical or socialistic scheme. It is better for the community served by an industry and better for the stockholders in any large corporation, said Mr. Shore, to have the control in the hands of the workers and customers, regardless of how much they know of corporate finance, than in the hands of individual owners or of banking interests.

## Does the Striker Gain or Lose and How Much?

A miner or other worker—no matter how much a week he gets—goes on strike for an increase of 10 per cent in wages. He stays out 21 weeks. If he gets the 10 per cent, it will take him just 10 times 21 weeks, equal to 4 years and 2 weeks, to get back to where he was when he struck. If he does not get the 10 per cent, where is he then?

He may say that he receives strike pay during the 21 weeks. But the strike pay is only his own union dues that he has been paying all along in anticipation of the strike; or else it is a contribution from non-striking union workers, who will expect something from him when they strike at some future time, or for whom he has already contributed in the past.

As the arithmetics used to put it: "Does he gain or lose; and how much?"

(The foregoing is taken from Robert Grimshaw's *Industrial Bulletin*, 717 West 177th Street, New York.)

## Wages and Hours in the Coal Industry

Data on bituminous coal production just released by the United States Bureau of Labor Statistic refer, unfortunately, to conditions as far back as the latter part of 1924. However, some of the outstanding figures are given below. The hours quoted are for a half-month period, earnings being given as an average daily figure.

	Hours of Work Daily Pay
Hand loaders, average...	63.3 \$6.32
Tennessee .....	...
Illinois .....	8.76
Machine miners, average...	72.9 9.65
Tennessee .....	4.58
Indiana .....	12.88

The State averages given are the maxima and minima. Possible average yearly earnings of both hand and machine miners and loaders, if they had worked all the days their mines operated in 1924, were estimated at \$1,128, with a range from \$649 in Tennessee to \$1,287 in Colorado.

Malleable iron castings and their manufacture is to be discussed at a meeting of the Philadelphia Foundrymen's Association, Friday, March 5, at the Engineers Club, Philadelphia, by H. S. Schwartz, manager of research for the National Malleable & Steel Castings Co., Cleveland. F. R. Palmer, Carpenter Steel Co., Reading, Pa., is scheduled to address the meeting on "What Happens When High-Speed Steel Is Quenched?"

# Mining and Metallurgical Engineers

## Violet Rays in Metallography, Delta Iron and Hardness of Steel Discussed at Annual Meeting—Symposium on Open-Hearth Practice—Notable Non-Ferrous Program

**A** NEW development in metallography throwing further light on the theoretical and practical value of delta iron, an important contribution to the theory of the hardness of steel and several valuable discussions of open-hearth practice were the features of the program of the iron and steel section at the annual February meeting of the American Institute of Mining and Metallurgical Engineers last week in New York, Feb. 15 to 18.

For the first time in the history of the Institute of Metals Division of the A. I. M. and M. E., four sessions were held. At these 17 papers on aluminum, aluminum-magnesium and copper alloys and products were presented and discussed.

The high standard set by the annual Howe Memorial and Institute of Metals lectures was maintained this year.

Brief abstracts of the principal papers and discussions by various metallurgists follow:

### Papers Presented at the Iron and Steel Sessions

**T**HE iron and steel sessions at which 14 papers were presented combined practical discussions of open-hearth problems and theoretical contributions to physical metallurgy. Besides a report of the sub-committee on open-hearth steel, four papers on furnace practice made up the program in this field. Two other sessions were devoted to papers which bore a strong resemblance to those usually constituting the program for a session of American steel treaters—a fact which was frequently commented upon. None of the sessions was largely attended.

#### Open-Hearth Furnace Session

**J.** V. W. REYNEDERS, president of the institute, was chairman of the session Wednesday morning, devoted to a discussion of open-hearth problems. One of the papers, "Effect of the Open-Hearth Process on Refractories," was withdrawn at the last moment. This paper was the joint production of G. A. Bole, supervising ceramist United States Bureau of Mines, Pittsburgh, F. W. Schroeder, senior investigator, Bureau of Mines, Pittsburgh, and B. M. Larsen, junior metallurgist, also at Pittsburgh. The paper is to be deferred until the meeting next fall, at which time more conclusive results are expected.

#### Making Rimmed Steel

In the absence of the author, Carl W. Peirce, superintendent open-hearth steel works, Mansfield Sheet & Tin Plate Co., Mansfield, Ohio, his paper was read by L. Reinartz, assistant general superintendent American Rolling Mill Co. at Middletown, Ohio. The paper recommended, for rimming steel, a charge containing not more than 40 per cent of pig iron and without iron ore. This was based largely on the fact that the silicon in good rimming steel must be eliminated to a very high degree. Good clean scrap should make up the steel part of the charge, and a sufficient amount of limestone be used to make good mushy slags when boiling loose from the bottom. Uniformity of scrap characteristics is another most desirable feature.

To prevent too much oxidation while working the heat, the bath temperature and the oxidizing influence of the slag must be controlled. In a heat finished with a slag too rich in oxygen, ferrous oxide is likely to be transferred to the metal up to the last moment

before tapping. With a very hot bath, the metal has a greater solvent power for ferrous oxide, regardless of its carbon content.

With either top or bottom pour, the steel should be hot enough to pour cleanly. For bottom pour it must be hotter than with top pour for the same results. It is felt that the best quality of steel is obtained when a flat saucer skull is left in the bottom of the ladle. Slow pouring is recommended, until 3 or 4 in. of metal has accumulated in the bottom of the mold. If the full force of the stream is opened up before this, the metal splashes up the walls and chills before the main body of metal reaches it. This makes small cracks, seams and tears.

Steel must not be overoxidized but must contain a sufficient amount of CO to produce the rimming effect. Silicon in the bath protects the carbon from oxidation and lessens the vigor of the boil. It thus limits the amount of CO formed and defeats the purpose. In the finished steel silicon must be down to a trace; for soft steel, 0.08 to 0.10 per cent carbon and 0.30 to 0.35 per cent manganese are preferred.

#### Discussion

Mr. Reinartz opened the discussion by stating that a pig iron with 0.9 to 1.25 per cent silicon and 1½ to 2 per cent manganese is especially desirable for this purpose. The judicious use of fluorspar in controlling the fluidity of the slag is very important. In using ore it is best to use large enough pieces so that they will go right through the slag and thus pass directly into the bath.

Clean ingot molds are essential to successful practice, particularly in avoiding the oxides of previous heats. These will get into the steel if left in the molds and will cause blow-holes around the top. As to nozzle sizes, it is best to play safe, using a large enough nozzle so that there will be no chance of chilling and so that there will be a fair uniformity in temperature between the first ingot and the last. A small skull in the ladle is desirable.

Carbon monoxide has been reported to be greatly in the majority in the gases coming out of killed rimming steel. Exhaustive studies on this feature, made by Paul Klingert, have been published recently in the Krupp *Monthly Bulletin* in Germany.

In some cases a considerable difference is found in the carbon content between the first ingot and the last ingot of a heat. This condition always connotes



DR. WILLIAM CAMPBELL

## The Annual Lectures for 1926

**T**WO American scientists delivered the lectures which for several years have become a feature of the annual February meeting of the American Institute of Mining and Metallurgical Engineers.

**D**r. William Campbell, Howe professor of metallurgy, Columbia University, New York, delivered the third Henry M. Howe memorial lecture.

**D**r. Paul D. Foote, physicist, United States Bureau of Standards, was the fifth annual lecturer before the Institute of Metals Division of the institute.



DR. PAUL D. FOOTE

a reaction between FeO and carbon on the one hand and MnO and carbon on the other. The result is an increase of CO with corresponding reduction of FeO and MnO and a slight increase in the proportion of manganese in the steel.

## What the Gases Are

Henry D. Hibbard, consulting metallurgical engineer, Plainfield, N. J., pointed out that analyses of gas taken from holes in ingots give most discordant results. From all the evidence he could gather he believes that hydrogen is probably the first and most important of the gaseous materials, carbon monoxide second and nitrogen or ammonia third. The smell of ammonia is quite pronounced in some cases when an ingot has been newly split. The surfaces of blow-holes in such cases give an alkaline reaction.

Commenting on one of the photographs in Mr. Peirce's paper, which showed a split ingot with a small number of blow-holes in it, Mr. Hibbard spoke of its being a surprisingly fine looking ingot for low-carbon open-hearth steel. He pointed out that blow-holes in the lower third of an ingot occupy far too large a proportion, and stated that they should be confined to not more than 10 per cent of the height.

## Surface vs. Strength

Charles L. Kinney, Jr., superintendent open-hearth department No. 1, Illinois Steel Co., Chicago, pointed out the necessity, for rimming steels, to work the heat down to a very low residual manganese. He thought it should be not over 0.25 per cent (Mr. Reinartz figured 0.20 per cent as the upper limit). Physical characteristics of the steel require a higher manganese than this, but the result is to produce surface imperfections in the shape of blisters or scabs. It thus becomes a question of physical characteristics vs. surface.

Wilmer E. Buck, metallurgist National Enameling & Stamping Co., Granite City, Ill., emphasized the poorer surface obtainable on a finished plate when there is higher residual manganese. He corroborated the report of great improvement in physical results obtained by the higher manganese.

Alexander L. Feild, United Alloy Steel Corporation, Canton, Ohio, referring to the question of gases in the blow-holes, and particularly with regard to hydrogen, stated that the more refined the analysis becomes, the smaller the amount of hydrogen found. He believes that probably no hydrogen as such remains in the steel, as the hydrogen should escape from the metal as readily as water from a sieve. He pointed out that blow-holes near the outside surface of an ingot have themselves bright surfaces, indicating the presence of a reducing or neutral gas. Deep-seated blow-holes, on the other hand, are not so constituted.

Regarding the question of hydrogen, Mr. Hibbard stated that he had found it on many occasions, but that, because of its very low atomic weight, its de-

tection must necessarily be by volumetric analysis. Any attempt to get it by gravimetric analysis would result in obtaining close to zero.

## Combustion in the Open-Hearth Furnace

K. Huessener, president American Heat Economy Bureau, Inc., Pittsburgh, read a paper devoted to open-hearth furnace combustion, with special reference to automatic control. The paper consisted largely of calculations worked out from observations of furnaces with and without control, the control being by means of an induced draft fan operated through the regenerator chambers. The regulator is designed for automatic operation, subject to such change as the furnace-man may require from time to time.

While the author gave a number of results of furnaces operated with and without his system of regulation, and showed the improvement obtained in both output and fuel consumption, when the control was used, he emphasized the necessity of a large number of exact heat balance sheets under varying conditions, laying special stress on the need of particular care in temperature measurements.

"Preheating temperatures for the present type of regenerators are naturally low. On new construction particular care should be taken, not only to increase the size of the chamber, but also to obtain equal distribution of gases over all parts of the chambers.

"Results obtained from an open-hearth furnace depend upon the amount of gas completely burned for a given period and on as low an excess of air as is possible. This necessitates installation of forced draft and induced draft fans and equipment, with automatic combustion control."

## Refractories

While the paper on refractories, as already stated, was not read, Dr. D. A. Lyon of the United States Bureau of Mines, Washington, commented briefly on the general topic. In deferring the paper to the fall meeting in Pittsburgh, this will permit those interested to see the laboratory where the tests were conducted and thus learn how the work was done. Gas samples have been taken from the checker chambers and the stack of a 50-ton open-hearth furnace. Observations on the brick of the furnace, together with these samples, have been used in the study of refractories.

Super-refractories, to take the punishment of a much higher temperature without distress, are being studied with a view to learning something of their commercial feasibility. Furnace tests in plants in and around Pittsburgh are under way, from which it is hoped to obtain data both interesting and important.

## Elimination of Metalloids

## Log of a 100-ton Basic Open-Hearth Furnace Heat

C. H. Herty, Jr., research associate Massachusetts Institute of Technology, located in the School of Chemi-



SAMUEL A. TAYLOR



J. V. W. REYNNDERS

*The New President of the Institute and the Retiring President*

cal Engineering Practice, at the Lackawanna plant of the Bethlehem Steel Corporation, read a paper prepared jointly by himself and J. L. Keats, chemical engineer E. I. DuPont de Nemours Co., Wilmington, Del. The test heat, which was made four years ago in a 100-ton stationary furnace at the Lackawanna plant, was subject to such careful checking, both in analysis and in the conduct of the heat, that the authors have used it as a basis or standard for future reference. An appeal was made to others studying this subject to make their tests so far as possible conform with the present ones, so that direct comparison may be possible.

Control of the scrap which went into the furnace gave definite information as to its composition. This scrap consisted entirely of ingot butts from rail heats, the average analysis being calculated from the analyses of the heats and the respective weights of scrap. Two ladles of pig iron were used in the charge and two samples taken from each ladle as it was poured. The composite of these four samples was used as the pig iron average.

#### Speed of Elimination Traced

By means of a large number of lantern slides, all reproduced in the original paper, Mr. Herty showed the manner, proportion and speed of elimination of each of the several metalloids from the bath. Unusual occurrences, such as those caused by the additions of the ladles of pig iron or by the use of ore during the finishing stage of the heat, were explained in running comment. The same procedure traced the changes in the composition of the slag during the progress of the heat.

Wide variations in composition of the bath, as sampled from one door or another, occur after additions of ore. This made it necessary to take samples from various locations simultaneously and to average them. Under finishing conditions, however, the bath is of such uniform composition that a test taken from any one of the furnace doors will represent the entire metal.

#### Desulphurization

With large amounts of excess air for combustion and with coal analyzing 1.18 per cent sulphur, desulphurization of the bath takes place. The chart shows a fairly steady drop from 0.045 to 0.022 per cent sulphur between noon and the time of tapping, just before 8 p. m. There is a strong probability that the gas given off from the decomposition of the limestone desulphurizes the bath.

"Erosion of the lining of the furnace is dependent, for a given amount of slag, primarily on its fluidity and its silica content. During the working period the controlling factors are the fluidity and the iron content of the slag. The rate of solution of lime into the slag from the limestone depends, for a given amount

of slag, both on its fluidity and on its iron oxide and silica content.

"Finally, one of the controlling factors in the rate of elimination of metalloids is the fluidity of the slag."

#### Chemical Equilibrium

##### Manganese, Carbon and Phosphorus Considered in Basic Open-Hearth Process

C. H. Herty, Jr., read a second paper giving results of a study of the open-hearth furnace process from the physico-chemical viewpoint. The study included experimentation in small laboratory furnaces and in standard 100-ton furnaces. The behavior of manganese, carbon and phosphorus are explained quantitatively. The action of residual manganese is discussed with reference to its relation to iron oxide dissolved in the metal.

Solubility of carbon monoxide in steel and its relation to dissolved FeO and carbon are given. The equation for phosphorus elimination has been tested out on a 200-ton furnace and the results are given in the text.

The author concludes that the amount of residual manganese, except when the slag contains over 5 per cent P<sub>2</sub>O<sub>5</sub>, is controlled by the total manganese charge, the amount of manganese volatilized, the iron oxide content of the slag, the slag basicity and volume and the temperature. The amount of iron oxide in the metal is not controlled by the residual manganese. The amount of carbon in the metal depends upon the concentration of iron oxide in the slag and on the temperature. The amount of phosphorus in the metal depends upon the total phosphorus in the charge, the iron oxide content of the slag, the basicity and volume of the slag and the temperature.

#### Heat Treatment and Physical Metallurgy

A FEATURE of one of the two steel sessions, the papers for which were largely in the field of physical metallurgy, was the presentation of a new development in metallography. Francis F. Lucas, member technical staff, Bell Telephone Laboratories, Inc., New York, whose work in high-power photomicrography has gained worldwide recognition, presented in abstract a paper entitled "Introduction to Ultra Violet Metallography." The paper was not preprinted but was presented, by the author, by means of a series of interesting slides.

#### Violet Rays and Metallography

Mr. Lucas prefaced his presentation with the statement that this new development was in its extreme infancy and that the present paper was largely a report of progress. He also stated that he regarded it as a decided step forward in the application of the microscope to the study of the structure of metals and that



DR. H. F. BAIN



T. T. READ

*The New Secretary of the Institute and His Assistant*



DR. JOHN A. MATHEWS



BRADLEY STOUGHTON

Chairmen of Two of the Steel Sessions

he had used it in solving a number of problems during the past year. He emphasized its main feature to be the fact that it largely increases the resolution which is at present obtainable by methods in use up to this time. A brief illustrated abstract of the paper is presented on other pages.

Dr. John A. Mathews, Crucible Steel Co. of America, New York, who presided, introduced the speaker by stating that this was the first presentation of an "extraordinary ordinary metallographic development" and that the institute is to be congratulated in having it on its program.

### Hardness of Steel

A novel and interesting paper dealing with the theory of the hardness of steel was presented by Dr. Albert Sauveur, professor of metallurgy, Harvard University, Cambridge, Mass., under the title, "Current Theories of the Hardening of Steel Thirty Years Later."

The author's paper is based upon answers to a questionnaire which was sent to 29 prominent metallurgists in this and other countries, 23 of whom replied. In 1896 Dr. Sauveur published his first paper dealing with the theory of the hardening of steel by rapid cooling and at that time it was extensively discussed. Because of some of the differences of opinion which have been advanced in recent years Dr. Sauveur was led to prepare the present paper. The questions which were asked were:

1. What in your opinion is the nature of martensite and what causes its hardness.
2. What are the conditions necessary for its formation and the mechanism of that formation.
3. If you believe it to be a solid solution of iron and carbon, or of iron and carbide  $Fe_3C$ , what position do you think the carbon atoms or the carbide molecules occupy in the space lattices of the crystals.
4. What part, if any, do you think that strains play in the hardening of steel.

The paper discusses in detail the answers to the various questions, giving at the same time the author's own reply to the questionnaire. Summarizing the results of all the replies the author states that he does not believe it is possible to formulate the prevailing view of metallurgists on the phenomenon of the hardening of steel. It is generally, but not universally held (1) that freshly formed martensite is a solution of carbon or of the carbide,  $Fe_3C$  in alpha iron; (2) that martensite forms and is retained when austenite transforms in the vicinity of 300 deg. C.; (3) that on aging, minute particles of the carbide are thrown out of solution, converting the martensite into an aggregate; (4) that the hardness of martensite is due wholly or partly to one or more of the causes previously mentioned. It is also generally held that troostite is a very fine aggregate of ferrite and cementite.

Comparing the situation today with that of 30 years

ago, the only progress made toward a solution of the problem may be thus summarized:

(1) Abandonment of the belief in the existence of beta iron; (2) X-ray analysis of iron-carbon alloys by which it is shown that gamma iron has a face-centered space lattice and alpha iron as well as the iron present in martensite, a body-centered space lattice, and (3) the belief that the hardness of martensite might be caused primarily (a) by the presence of submicroscopic ferrite grains or (b) by the distortion of the space lattices resulting from the presence of carbon atoms in enforced solid solutions.

As an appendix to the paper the detailed replies of all of the metallurgists are printed.

### Discussion

In introducing the discussion, Dr. Mathews characterized the paper as an interesting presentation of the knowledge of today on the subject and as offering a good case for several of the points upon which there is considerable difference of opinion.

Dr. S. L. Hoyt, research metallurgist, General Electric Co., Schenectady, N. Y., expressed his appreciation of the author's paper and, after discussing certain phases of it, called attention to a new viewpoint of the subject which he presented at the Schenectady sectional meeting of the A. S. S. T. from a distinguished German metallurgist. The paper referred to is one entitled "On Martensite" by H. Hanemann and A. Schrader, the translation of which is printed in the February issue of the *Transactions of the American Society for Steel Treating*. A written discussion by Dr. Zay Jeffries and R. S. Archer, Aluminum Co. of America, Cleveland, Ohio, was presented by Dr. Jeffries. Their remarks were in part as follows:

The members of the Institute are indebted to Professor Sauveur for his compilation of current opinion on the hardening of steel. Quite aside from any possible value in the establishment of scientific truth, such a digest can not but be interesting, and will probably be still more interesting in retrospect 30 years later.

There is, of course, only one correct answer to the question, and it should be the object of all scientists to ascertain this answer. It is not anticipated that all of the details of this problem will be worked out for many generations. It is important, however, in these studies to hold the ground which science has already won, to provide a sound foundation for further investigation and to thus progress toward an even better understanding of the hardening and hardness of steel.

It seems probable that much ground would be lost if certain of the views put forward in the present paper were given the weight ordinarily accorded to Professor Sauveur's conclusions. His ideas on the sequence of changes in the hardening and tempering of steel, his conception of troostite, and his views on beta iron as a factor in hardening are at variance with the great mass of existing evidence. In fact, he makes no attempt to reconcile his views with the conflicting evidence.

The writers were interested in Professor Sauveur's

Mr. Lucas, who made public for the first time a progress report on the results of his work with the violet ray, has made notable contributions to high-power photomicrography. He is connected with the Bell Telephone Laboratories, Inc., New York



F. P. LUCAS

"clear anticipation" of the slip-interference theory of hardening, as stated on page 16 of the preprint of his paper. In preparing their statement of this theory, the writers availed themselves of the results of many previous investigations, the most fundamentally important of which were carried out within the last 30 years. If there is any merit in this statement, the credit is due to the entire body of scientific men whose work has made the generalization possible. The establishment of truth is, however, a more important objective than the apportionment of credit.

It is not desired to detract in any way from Professor Sauveur's splendid pioneer work on the hardening of steel, but the writers would like to point out that his theory of hardening of 1896, as given on page 16, is not in accordance with their own. The slip interference theory in part rests on the following fundamental postulates:

The hardness and strength of even the hardest alloys depend primarily on the high inherent cohesion of the atoms of the predominant metal.

Metals are commonly soft because of the existence of planes of potential slip which render impossible the realization of this inherently great cohesion.

The hardening and strengthening of metals by any of the known methods may be considered as due principally to "slip-interference."

Professor Sauveur's explanation of 1896 involves the older conception that iron is inherently soft, so that the hardness of hardened steel must be due to the presence of some material which is itself very hard. In fact, he supposed that it was necessary for the soft iron to be surrounded "on all sides" by the hard cementite. There was naturally no mention of the fundamentally important slip mechanism of deformation, since this was not discovered until after 1896.

The problems of the hardness of hardened steel is now one of evaluating the various factors which may increase resistance to slip. This evaluation must rest, of course, on a true conception of the constitution of hardened steel.

During the last few years considerable progress has been made in quantitative estimates of the slip resisting factors in both ferrous and non-ferrous metals and alloys. At the present rate of progress a still better understanding of hardened steel can confidently be expected in the near future. The writers can hardly agree with Professor Sauveur that the progress of the last 30 years "does not constitute a very material advance, if advance at all."

### Annealing and Hardness of Ingots Iron

"The Effect of Annealing Upon the Hardness of Cold-Worked Ingots Iron" was the title of a paper by Charles Y. Clayton, department of metallurgy, Missouri School of Mines, Rolla, Mo. Cold compressed iron having a carbon content of 0.03 per cent, regardless of the amount of cold work, hardens upon being annealed, says the author, at a temperature within the blue heat range between 250 and 425 deg. C. Samples compressed under loads of 20,000, 30,000, 35,000 and 40,000 lb. respectively, soften upon being annealed between 500 and 600 deg. C., but samples compressed under 10,000 and 15,000-lb. loads do not soften on annealing. The material used throughout was Vismara iron of which  $\frac{1}{2}$ -in. stock was cut into cylinders  $\frac{3}{4}$ -in. long and compressed in a Reihle testing machine and afterwards annealed in a Hump furnace.

### Structure of Cold-Worked Metals

Another paper dealing with cold-worked metals was presented by Dr. V. N. Krivobok, research associate bureau of metallurgical research, Carnegie Institute of Technology, Pittsburgh, the title of which was "A Photomicrographic Study of the Process of Recrystallization in Certain Cold-Worked Metals." The author starts with large single crystals of an iron-silicon alloy which are put through certain processes of cold rolling. Various changes in the structure of the alloy are studied and the author in his presentation used a large number of photomicrographs which also appear in the paper. An interesting feature is the discussion of the development of Neumann bands.

Doctor Sauveur, commenting upon this paper, stated that it was a pleasure to hear the presentation of such an excellent piece of work, dealing with the mechanism of recrystallization of iron after cold working.

### New Development in Malleable Iron

A new development in malleable iron, which was not scheduled on the program, was brought to the attention of the meeting by L. H. Marshall, metallurgist Ohio Brass Co., Mansfield, Ohio, in a paper entitled "A Process for the Prevention of Embrittlement in Malleable Cast Iron." Reference to this new product was published in THE IRON AGE, Feb. 4, in a brief article entitled "Flecto, a New Type of Malleable Iron." The present paper gives the details of the treatment to which the iron is subjected to prevent embrittlement and an abstract is published on other pages.

The only discussion for which there was time at this session was offered by a representative of the Westinghouse Electric & Mfg. Co., Pittsburgh, who was inclined to criticize the process. He stated that his company had done some work along the same lines but, on very thin section castings, they had found that the composition was of more importance than the heat treatment in preventing embrittlement under the circumstances.

### Delta Iron and Iron Alloys

DELTA iron and the iron-tungsten and the iron-chromium alloys played a prominent role in the program of one of the sessions. There have been three important references recently to delta iron and the alloys which give rise to its formation, the first one having been in December when Dr. Zay Jeffries delivered the first Robert Henry Thurston lecture before the American Society of Mechanical Engineers in New York in which he discussed the iron-molybdenum alloys. At the winter sectional meeting of the American Society for Steel Treating at Buffalo, (THE IRON AGE, Jan. 28, 1926) E. C. Bain discussed the same subject in connection with the iron-chromium alloys.

### The Iron-Tungsten System

At the convention last week the subject was again brought out by W. P. Sykes, metallurgist, National Lamp Works, Cleveland, in his paper "The Iron-Tungsten System." Mr. Sykes presented a brief and interesting abstract by means of slides in which he outlined the work which has been done by him over a number of years. According to the author, the iron-tungsten system comprises

(a) a solid solution of tungsten in iron 33 per cent of tungsten being soluble at 1525 deg. C. and 8 per cent at room temperature; (b) a eutectic at 19 per cent tungsten being a conglomerate of the compound  $Fe_3W_2$  and the solid solution of tungsten in iron; (c) the compound iron-tungstate ( $Fe_3W_2$ ) at the composition 68.7 per cent tungsten; (d) beyond this composition there may be present, if below 1650 deg. C., the compound plus iron in tungsten solid solution. If heated above 1650 deg. C. the iron-tungstate decomposes into iron-rich and tungsten-rich phases; (e) tungsten dissolving 1.2 per cent iron at 1600 deg. C.

The critical point  $Ar_1$  is lowered from 1400 to 1200 deg. C. and the point  $Ar_2$  is raised from 890 to 980 deg. C. by the addition of 5.5 per cent tungsten to iron.

The Brinnell and Rockwell hardness of iron increases continuously with the addition of tungsten in amounts up to about 50 per cent by weight.

The hardness of some of these alloys, water-quenched from 1500 deg. C., is increased as much as 130 per cent by aging at temperatures from 600 deg. to 700 deg. C.

In aging at a given temperature, the hardness reaches a maximum and then decreases as aging is prolonged.

The higher the temperature of aging, above a certain minimum temperature, the more rapidly the hardness increases, but the lower is the maximum hardness attained.

The tensile strength is affected by aging in the same manner as the hardness, a decrease in ductility accompanies the increase in tensile strength.

Development of secondary hardness in these alloys is accompanied by precipitation of the compound  $Fe_3W_2$ . The particle size of the precipitate remains submicroscopic until the hardness has passed through its maximum value and has fallen off considerably.

A shrinkage in volume takes place during the

aging process and, in general, its maximum is coincident with that of the hardness produced by aging.

An interesting observation by the author was that a notable similar example of hardening by aging is found in the aluminum-copper alloy system. Aluminum alloys of the duralumin type when quenched from 500 deg. C. increase in hardness about 50 per cent by subsequent aging. This hardening was attributed, after a thorough study of these alloys, by Merica, Waltenberg and Scott to the compound  $\text{CuAl}_2$ , which is precipitated in a finely divided state during the aging process. When aged at temperatures of 150 to 200 deg. C., the hardness of these alloys first increases to a maximum and then decreases. During that aging there has been a formation of fine nuclei of  $\text{CuAl}_2$ , followed by coalescence of these particles into one of large size, say the authors, who deduce from these results the fact that there is a certain average size of particle of  $\text{CuAl}_2$  for which the hardness of the material is a maximum. If in the conclusions just quoted from these authors there is substituted  $\text{Fe}_3\text{W}_2$  for  $\text{CuAl}_2$ , the conclusions

tant the changes in the solid state have been carefully determined and incorporated in the diagram. "There are a number of points in this paper which could be discussed with profit but I should like," said Dr. Jeffries, "to point out in particular the relation of some of Mr. Sykes' work to the quantitative estimation of some of the factors which increase hardness by slip-interference."

The details of Dr. Jeffries's argument, for which there is not room here, will appear in detail in the *Transactions* of the institute. He concluded his discussion with the statement that "it is therefore apparent that these researches, aside from other values, throw much light on the whole problem of the hardening and the hardness of steel."

### Heat Treatment of Carbon Steel

A paper dealing with the heat treatment of carbon steel was entitled "Influence of Temperature, Time and Rate of Cooling on the Physical Properties of Carbon



DR. ZAY JEFFRIES



W. P. SYKES



E. C. BAIN

THE three metallurgists who are prominent in the work on delta iron and the iron-molybdenum, iron-tungsten and iron-chromium alloys.

are fully as applicable to the observed performance of iron-tungsten alloys upon aging.

### The Iron-Chromium Alloys

After the presentation of Mr. Sykes' paper, E. C. Bain, metallurgical engineer, Union Carbide & Carbon Research Laboratories, Long Island City, N. Y., discussed "Delta Iron in the Iron-Chromium Alloys." Mr. Bain illustrated his presentation with slides. The paper was in large part the same as the one presented by him at the Buffalo meeting of the Steel Treaters in January, (THE IRON AGE, Jan. 28) but it discusses also the mode of change of gamma iron into delta iron.

#### Discussion

The two papers were briefly discussed together. M. A. Grossman, research metallurgist, United Alloy Steel Corporation, Canton, Ohio, emphasized the excellence of these papers and stated that they constituted a confirmation of a theory 10 years old. The theory has been proved by the iron-tungsten, iron-chromium, as well as by the iron-silicon and iron-vanadium alloys. There is, he said, a distinct practical value to the alloys. Taking high-speed steel as an illustration, containing 3.50 to 4 per cent vanadium, it was his opinion that a peculiar softness which manifested itself at certain temperatures could be explained by the work of these authors.

Dr. Zay Jeffries, in discussing Mr. Sykes' work, characterized it as constituting the beginning of a new art which will include the hardening of carbonless iron alloys and the heat treatment of iron alloys in which gamma iron plays no role. Already this work has resulted in the production of an alloy which has superior red hardness of high-speed steel. The paper reflects the careful work of the author in the determination of the solidus and liquidus lines, but what is more impor-

Steel" by Francis B. Foley, metallurgist Lucey Mfg. Co., Chattanooga, Tenn., and two other associates. The paper presents the results of an investigation into the behavior of a steel containing 0.75 per cent carbon under the influence of various treatments by a proper control of the time and temperature factors. The results obtained in the treatment of steel containing 0.52 per cent carbon by quenching and drawing are also given. A large number of photomicrographs illustrate the authors' work. The work demonstrates among other things that higher values for impact resistance are obtained with a steel of 0.52 per cent carbon if a drawing at 450 deg. to 675 deg. C. is preceded by quenching in water from temperatures in the neighborhood of 1000 deg. C. than when the preparatory hardening is done from temperatures nearer but above the critical point. This procedure is contrary to the usual process for hardening. If, in order to produce the best impact values in quenched and drawn steel, it is necessary to go to such high temperatures and quench therefrom, considerable advantage will be lost in the case of intricately shaped pieces because of the great danger of cracking.

### Steel Deformation by Explosion

Another paper by Mr. Foley, in collaboration with J. E. Crawshaw, was entitled "Effect of Air Gap in the Explosion System on the Production of Neumann Bands." The authors state that in order to demonstrate experimentally that the development of Neumann bands was determined by the suddenness of the deformation of the metal in which they were produced, a return was made to the use of explosives as the source of energy, an air gap being interposed between the charge of explosives and the disk. The specimen which had no air gap between it and the explosive showed numerous Neumann bands with an increase in the air space from

4 up to 16 mm. There is little change in the appearance under the microscope, say the authors. The number seems to decrease gradually until with an air gap of 120 mm. no bands appear at the center of the specimen. It has not been found possible, say the authors, to detect Neumann bands thus far in steels which have been subjected to very sudden deformation unless the steel contains an excess of free ferrite. This necessitates the use of a very low carbon steel in the annealed state.

Professor Bradley Stoughton, who occupied the chair at this session, declared that this paper opens up a new field and asked the authors what they use as a standard, pointing out the fact that basic steel is less soluble in steel than acid steel. Mr. Foley, who presented the paper, said that the standard has been a specimen of steel free from Neumann bands.

### Cyanide in Iron Blast Furnaces

The only paper dealing with the iron blast furnace was presented in abstract by the author, Richard Fran-

duction of 31.3 per cent can be made without eliminating cyanide in the case of the 2300 lb. of coke, is it possible to reduce the 1580 lb. case by 31.3 per cent? I object, as a blast furnace man, to the author's statement "that the blast furnace is a gas producer." Toward the close of his paper he admits that the blast furnace is only about one-half a gas producer. To say that a blast furnace is a gas producer, or to say that it is a lime kiln is to admit that blast furnace practice at that particular furnace is so wretchedly poor that it cannot be classed with present day practice. I have been on the lookout for proof of this cyanide accumulation theory for sometime but I have been unsuccessful. The author's paper is, however, a stimulus for further investigation of the waste of coke in the iron blast furnace.

### The Annual Lectures

IT is the custom of the institute each year to have on its program two important lectures; The Henry M. Howe memorial lecture and the one presented under the auspices of the Institute of Metals Division. The first Howe memorial lecture was presented two years ago by Dr. Albert Sauveur and the one last year by Dr. John A. Mathews. The third lecture was delivered this year by Dr. William Campbell, professor of metallurgy, School of Mines, Columbia University, New York. His subject was "Twenty-five Years in Metallography." An abstract of this lecture will probably appear in a later issue of *THE IRON AGE*.

The first Institute of Metals lecture was delivered by Dr. W. D. Bancroft, Cornell University, three years ago, and the second by Dr. Zay Jeffries in 1924 with the third one last year by Dr. Carl Benedicks of Stockholm, Sweden. The one this year was presented by Dr. Paul D. Foote, physicist, Bureau of Standards, Washington, who discussed "The Relation Between Metallurgy and Atomic Structure."

Both lectures were largely attended and delivered at 4 p. m. on Monday and Tuesday afternoons, Feb. 15 and 16, respectively. It is announced that Dr. Cecil H. Desch, professor of applied science, University of Sheffield, Sheffield, England, will deliver the annual lecture in February, 1927.

### New Officers of the Institute

THE annual meeting of the institute was held Tuesday morning, Feb. 16, at which the officers for the new year were elected as follows:

*For president and director:* Samuel A. Taylor, consulting engineer, First National Bank Building, Pittsburgh.

*For vice-president and director:* Birch O. Mahaffey, St. Louis, and Carl A. Meissner, United States Steel Corporation, 71 Broadway, New York.

Retiring president, J. V. W. Reynders, and past president, William Kelly, became directors for two and one years respectively. The new president and vice-presidents were elected for a term of three years.

*For directors (three years):* L. K. Armstrong, Spokane, Wash.; H. A. Guest, American Smelting & Refining Co., New York; W. Spencer Hutchinson, Massachusetts Institute of Technology, Cambridge, Mass.; Seelwy W. Mudd, Los Angeles, Cal., and Reno H. Sales, Butte, Mont.

Later in the day the directors elected for one year the following officers:

*Secretary:* Dr. H. Foster Bain.

*Assistant Secretary:* T. T. Reed, Washington.

*Secretary Emeritus:* F. F. Sharpless, Westbury, L. I. *Treasurer:* Charles F. Rand, 71 Broadway, New York.

### Saunders Medal Established

The establishing of a new medal was authorized by the board of directors. It is to be known as the William L. Saunders Medal and will be awarded for distinguished work in scientific mining. It is named for Mr. Saunders, a past president and director, who has furnished the necessary funds for its maintenance.

### The Banquet and Special Awards

A feature of the annual banquets of the institute is the awarding of various medals to members who have distinguished themselves in some particular field. At



C. L. KINNEY, JR.



J. M. CALLOW

Two of the medalists for 1926

chot, vice-president Ferro Chemicals, Inc., Washington, under the title "Economic Significance of Cyanide Accumulation in the Blast Furnace." The author contends that the greatest loss of energy to the blast furnace from an efficiency viewpoint is in its failure to convert more than about one-third of the coke carbon from carbon monoxide to carbon dioxide. This result has usually been ascribed to the necessity of a two to one excess of carbon monoxide in order to reduce the iron. It has, however, been proved that iron is completely reduced by equal volumes of carbon monoxide and carbon dioxide. Hence, contends the author, there is room for the hypothesis that vaporization, as cyanide, of accumulated alkalis is a serious primary factor eliminating the ratio of iron ore to coke. The basis for a quantitative explanation of the action of the furnace is the observed cyanide vapor concentrations and those measured by the variations of the nitrogen-oxygen ratio in the gases of the hearth.

### Discussion

The value of Mr. Franchot's paper consists in its startling assumption rather than its record of actual facts, said Ralph H. Sweetser, assistant to the vice-president, American Rolling Mill Co., Columbus, Ohio. Doubtless all blast furnace men will admit that more coke per ton of pig iron is used than should be, but when we find records of only 1580 lb. of coke per ton of iron for one furnace and as high as 2300 lb. at another during the same month, we know that there is much more waste at the second furnace than at the first furnace. The large difference of 720 lb. is not due to elimination by cyanides. There were several other causes outside of the furnace. The great trouble with the author's paper is that he does not give the amount of coke necessary to make a ton of pig iron. If a re-

the banquet this year at the Waldorf-Astoria Hotel, Wednesday evening, Feb. 17, three medals and awards were made as authorized by the directors.

*The Robert W. Hunt Medal*

The Robert W. Hunt medal, established by former associates of Captain R. W. Hunt, past president and honorary member of the institute, was accepted on behalf of the institute by Herbert Hoover in May, 1920, the acting president at that time. The only award made previous to this year was on that occasion, when it was bestowed upon Captain Robert W. Hunt in honor of whom the fund was established. This year it was awarded to Charles L. Kinney, Jr., for his paper on "Economic Significance of Metalloids in Basic Pig Iron in Basic Open-Hearth Practice." The recipient, who was graduated from the Massachusetts Institute of Technology in 1899, is now superintendent of plant No. 1 of the open-hearth department of the South Works of the Illinois Steel Co. In 1922 he was the recipient from the institute of the Sir Robert Hadfield award for a joint paper with G. R. McDermott on the "Thermal Efficiency and Heat Balance of an Open-Hearth Furnace."

*The James Douglas Medal*

The James Douglas medal, established by anonymous donors in 1922, commemorates the life and work of Dr. James Douglas, distinguished engineer and metallurgist and twice a president of the institute. The medal is awarded each year for distinguished achievement in non-ferrous metallurgy. In the past three years it has been awarded respectively to Frederick Laist, Charles W. Merrill and William H. Bassett. This

year it was bestowed upon John M. Callow for distinguished services in the concentration of ores, particularly in methods of flotation. Mr. Callow, who was born in Norfolk, England, has specialized since 1912 in flotation, his most notable achievement being the application of pneumatic flotation to ore treatment and invention of the cell used in that art. He is now connected with the General Engineering Co., 50 Broad Street, New York.

*The J. E. Johnson, Jr., Award*

The J. E. Johnson, Jr., award, the fund for which was established in 1921 to encourage young men working along the lines of research followed by the distinguished metallurgist whose name it bears, was bestowed this year upon Selwyne P. Kinney, who is now general supervisor of blast furnace studies for the United States Bureau of Mines, including particularly the operation of the experimental furnace at the University of Minnesota. The only previous granting of this award was to Alexander L. Feild in 1923 for his paper on "A Method of Measuring the Viscosity of Blast Furnace Slags at High Temperatures."

C. L. Kinney and John M. Callow were present to receive notification of the awards, but S. P. Kinney was unavoidably detained. The formal presentation will be made to him at the fall meeting of the institute in Pittsburgh early in October.

There was the usual large attendance at the banquet, which was presided over in a most happy manner by Wilbur A. Nelson, economic geologist, Nashville, Tenn. The usual brief addresses were made by the retiring president, J. V. W. Reynders, and the new president, Samuel A. Taylor.

## Sessions Devoted to Non-Ferrous Metals

REMARKABLE interest was manifested in the non-ferrous metal programs, the attendance easily outnumbering that of the steel sessions four to one. Attention was divided between the aluminum and aluminum-magnesium alloys, and the properties of commercial copper as affected by gas content. In these discussions technical representatives of the leading aluminum and copper companies took a prominent part—a circumstance worthy of remark in the light of what used to be a definite policy of many of these interests to enjoin silence on their staffs.

### Fatigue of Metal

Dr. D. J. McAdam, Jr., of the Naval Engineering Experiment Station, Annapolis, Md., presented a brief paper bringing up to date his extensive tests on monel metal and duralumin. Difference of opinion exists as to whether these alloys have been tested for a sufficient number of alternations to exhibit a definite endurance limit. Doctor McAdam thinks his plotted results show an unmistakable trend in this direction. It was pointed out in discussion that information is available which allows a part to be designed safe for a billion repetitions of stress and, for practical purposes, that is sufficient, since machines would wear out or become obsolete before that period is passed.

### Discussion

In response to a question as to whether fatigue testing resulted in a general breakdown of the metallic structure, Doctor McAdam said he knew of no test runs which had been interrupted before failure, and the piece then removed and tested in tension or otherwise. Bearing some light on this problem, however, is the fact that specimens running under severe loads, which would cause failure in a short time, exhibited numbers of surface cracks some time before the piece broke in two.

### Hard Lead

A very comprehensive paper on the lead-antimony series of alloys was presented by Messrs. Dean, Zichrick and Nix of the Western Electric Co. It is the result

of long studies on metal for sheathing electrical cables.

Contrary to former information, it was found that as much as 2.50 per cent of antimony is soluble in the solid lead, this maximum solubility decreasing with temperature. Such conditions are those necessary and sufficient for the hardening and annealing phenomena, well known in steel. Investigation therefore revealed the fact that a 2.50 per cent antimony alloy possessed superior strength and hardness and, after quenching from the proper temperature, became harder with age—just as does duralumin and some other alloys.

### Discussion

Prof. C. R. Hayward of Massachusetts Institute of Technology described similar results found in lead-antimony-tin alloys used in making stereotypes from which newspapers are printed. In this alloy, an annealing will soften the casting so it can be bent around the press cylinder, after which it re-ages, sometimes very rapidly. F. R. Pyne also pointed out that the investigation indicated that the use of lead alloys, containing 4 per cent or 10 per cent of antimony for lining electrolytic tanks, was mistaken, and that better mechanical results could be expected from the 2.50 per cent alloy if it proved to have satisfactory corrosion resistance.

### Elektron

In "A Preliminary Study of Magnesium-base Alloys," Prof. Bradley Stoughton and Mr. Miyake of Lehigh University describe the alloy "Elektron," which has excited so much attention in recent German literature. Elektron applies to a series of magnesium-zinc alloys containing from 92 to 95 per cent magnesium. They may be hot-worked, and are hardened from Brinell 74 to 100 by heat treatment and artificial aging, without much change in the ultimate strength. The latter varies from 19,000 lb. in the cast alloy to 60,000 lb. per sq. in. for the especially hard forgings. Its specific gravity is about 1.8.

### Light Aluminum Alloys

Two quaternary alloys, aluminum-copper-magnesium, plus nickel or iron, were described by Samuel

Daniels of the Army Air Service. These are principally used for gas engine pistons, operating at high temperature, in the form of heat-treated castings. The alloy containing nickel is the so-called "Y" alloy, developed in England since the war, and is probably the more popular. While it has not such properties when tested cold, it retains its strength and hardness better when working continually at temperatures from 500 to 700 deg. Fahr.

#### Discussion

Prof. A. E. White of the University of Michigan told of recent developments in the automobile field. The manufacturer of one popular car is experimenting on composite pistons of Y alloy and invar, a high nickel iron with very low coefficient of expansion. Ford is also making light pistons by welding three sheet metal stampings together to form the skirt, and then welding in a forging for the connecting rod bearing.

#### Pure Aluminum-Copper Alloys

E. H. Dix, Jr., and H. H. Richardson of the Aluminum Co. of America have investigated the aluminum-copper alloys, prepared with metals of quite unusual impurities. In this manner their results are free from the difficulties of interpretation caused by small amounts of other metals occurring in commercial alloys. By means of a very skillful technique they have been able for the first time to observe in these alloys tiny particles of the compound Cu Al<sub>2</sub>, precipitated from solid solution by a long high anneal. This compound, and its specific action on the hardening of duralumin, was predicted by Merica and his associates seven years ago.

In view of this brilliant pioneering work, it would be fitting to name the compound, Cu Al<sub>2</sub>, "Mericate." It has the same general function in the heat treatment of aluminum that the iron carbide, "Cementite," has in the hardening of steel.

#### Modified Aluminum-Silicon Alloys

Modified aluminum-silicon alloys were discussed by R. S. Archer and L. W. Kempf, also of the Aluminum Co. of America. The authors described the great improvement possible in certain of these alloys by melting them under a flux of sodium fluoride and salt (as advised by Dr. Pacz) or by mixing a little metallic sodium shortly before pouring. The recommended procedure in the latter method is to place a weighed portion of sodium in a preheated ladle, large enough to hold the molten alloy, tap the molten alloy into the ladle, hold a specified time for the refining to be complete, and then pour the molds. Reasons were advanced for the belief that the eutectic point is shifted by the sodium addition (which, by the way, is mostly slagged off) and the normal freezing of silicon retarded. When it does occur it takes place in much finer particles than otherwise expected. It is important to keep the amount of iron in the alloy to 0.50 per cent or lower if good ductility in the casting is to be had. Highest strength may be had with an alloy containing 13.7 per cent silicon, but proper treatment requires more sodium than the usual 13.0 per cent alloy used commercially. The latter has the advantage of being less susceptible to fluctuations in the manufacturing routine, and yet has very superior casting qualities.

#### Troubles with Gassy Copper

Under the able leadership of S. Skowronski of the Raritan Copper Works a series of eight important papers on copper was presented. In recent months some very obscure troubles with refined copper have been experienced by rolling mills and wire drawers. Intensive study has shown that many of these troubles are due either to an abnormally high content of oxygen, in the form of cuprous oxide, or to copper containing a more moderate amount having been heated in a reducing atmosphere.

Cuprous oxide is soluble in metallic copper to a slight extent. It forms in the refining furnace very rapidly, and at the end of the operation is largely reduced by stirring the bath with sapling poles. A small amount, however, is left, in order to control the "set"

or solidification contraction of the cake or wire bar into which the copper is cast.

For many purposes copper entirely free from oxygen and other impurities is desirable, but it becomes difficult to refine to a much greater extent than the 99.97 per cent pure, which is now obtainable commercially in large tonnages and at the ruling market rates. Great care must be taken in the pouring, so that excessive formation of cupric oxide will not form in that brief period, which often exudes from the ingot surface in small pimples, and which is responsible for mottled



W. M. CORSE



DR. PAUL D. MERICA

Doctor Merica is the new chairman of the Institute of Metals Division for 1926. Mr. Corse was reelected secretary

or lacy markings on the surface of polished articles made from them.

The damage by heating in reducing atmosphere is caused by a reduction of cupric oxide to spongy copper. Since normally the free cupric oxide occurs in pearlitic patches of eutectic at the grain boundaries, the production of spongy material at such places causes pronounced brittleness, fracture being always between the crystalline grains.

Miss Susan B. Leiter, microscopist, research laboratories, General Electric Co., Schenectady (the first woman member of the institute to present a scientific paper), was given a warm welcome. In a paper, "Annealing of Commercial Copper to Prevent Embrittlement by Reducing Gases," she described experiments made a few years ago which enabled the General Electric Co. to avoid this embrittlement. They found that, by a proper annealing and slow cooling, the cuprous oxide in commercial copper could be "spheroidized" or collected in tiny balls located throughout the metal independent of the crystalline grains. "Gassing" such copper (heating in hydrogen or some other reducing atmosphere) then produced tiny holes in the metal, lined with spongy copper, but since these blowholes were scattered throughout the mass at random, no brittle grain boundaries existed and the metal retained excellent ductility.

#### New Officers of the Institute of Metals

THE annual dinner of the Institute of Metals Division, attended by about 100 members and guests, was held at the Harvard Club, New York, Tuesday evening. It was presided over by the chairman of the institute, George K. Elliott, chief metallurgist of the Lunkenheimer Co., Cincinnati.

The secretary, William M. Corse, Washington, in his report stated that the membership of the institution is now 617. A report of the committee on papers through its chairman, Stanislaus Skowronski, research chemist Raritan Copper Works, Perth Amboy, N. J., showed that unusual success had been obtained this year in securing papers, in that the largest presentation ever made was provided for the sessions at this convention. The chairman also stated that the prospects

were excellent for some very interesting papers for the meeting of the division to be held in Detroit the week of Sept. 27 at the convention and exhibition of the American Foundrymen's Association.

The research committee, appointed a year ago, reported through its chairman, Dr. Paul D. Merica, International Nickel Co., New York, that the consensus of opinion of the various members was that the institute for the present should obtain from its members a carefully prepared statement of various problems in which research is advisable. Following this report, an interesting and valuable discussion was participated in by Dr. Zay Jeffries, Cleveland, and Col. A. E. White, University of Michigan, Ann Arbor, Mich., as to the

practicability and scope of research in general and the extent to which the institute could profitably enter this field.

The nominating committee, consisting of G. H. Clamer, Ajax Metal Co., Philadelphia, chairman; William H. Bassett and Jesse L. Jones, recommended the nomination of the following officers for the ensuing year:

*For chairman:* Dr. Paul D. Merica.

*For vice-president:* Dr. Zay Jeffries.

*For secretary:* William M. Corse.

*For members of the board:* William K. Frank, H. C. Jennissen, R. L. Suhl, R. F. Wood, Robert J. Anderson, David Levinger, Stanislaus Skowronski, L. W. Spring, J. R. Freeman, Jr., and Paul McKinney.

# Microscope and Ultra-Violet Light\*

## New Development in Metallography—Introduction to Its Use—Greater Resolution of Structures One Advantage

BY F. F. LUCAS

**A**BOUT four years ago, in order to investigate the possibilities of ultra-violet metallography, the Bell Telephone Laboratories arranged with the Zeiss scientific staff to design a complete photomicrographic equipment using a wave length of  $275 \mu\mu$ . It was desired to obtain if possible a horizontal type of equipment similar in design to the Martens metallurgical outfit which had been used successfully at high powers. The design of such a horizontal type of equipment was deemed impracticable by the Zeiss staff, so that the equipment finally developed was of the conventional vertical type.

In this equipment the source of illumination is a spark gap and a quartz slit. The light passes through a collimator and two prisms of quartz to emerge from the prism diaphragm in the form of a line spectrum. The desired line is focussed on the vertical illuminator of a metallurgical microscope and, by means of a suitable optical system contained within the vertical illuminator, is caused to illuminate a quartz plate which deflects the light downward to the specimen as in any metallurgical microscope employing the Beck type illuminator. Since light waves invisible to the human eye are used, a fluorescent screen is employed to center the light on the aperture of the vertical illuminator. Once the light is centered this screen is removed and another substituted in the form of a searcher eye-piece. The searcher eye-piece is used for viewing the image and it is placed just above the ocular of the microscope. A schematic diagram of the optical system is shown in Fig. 1.

### Description of the Equipment

The assembly of the equipment is illustrated in Fig. 2 and consists of two units. The microscope is the research IS stand, fitted with a special vertical illuminator. It is secured to the base of the vertical camera stand. The camera is for  $5 \times 7$  plates or smaller and permits a bellows extension of 80 cm., but an extension of approximately 30 cm. only is used because of the focal computations which enter into the problem. The camera is arranged to swing out of position so that a "searcher" or focussing eye-piece may be brought into position just above the ocular of the microscope.

The searcher consists of a fluorescent screen which is viewed by a magnifier. The fluorescent screen has cross rulings so that the magnifier may be placed in

exact focus for the image, which will be made visible by the fluorescence of the screen under the action of the ultra-violet rays. The camera and microscope are mounted on a stool of substantial construction as shown.

The vertical illuminator consists of a quartz plate mounted in a tube and capable of being accurately ad-

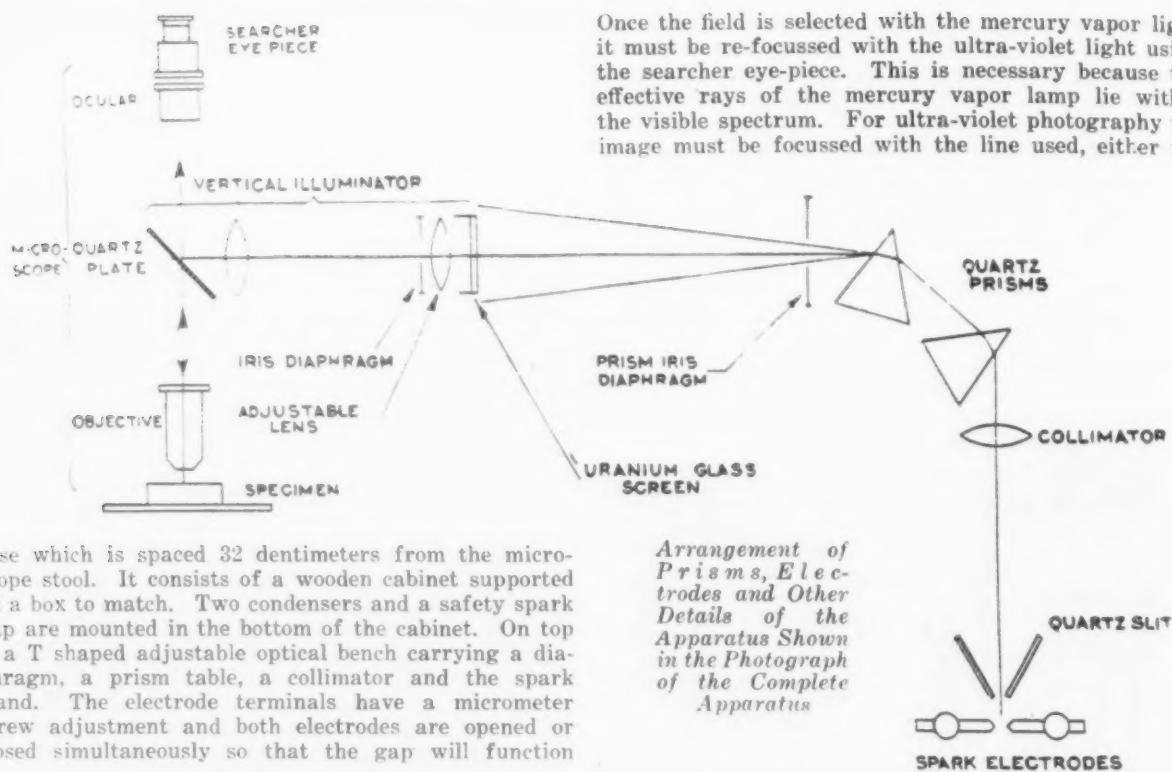


Complete Apparatus for Applying the Violet Ray to Photomicrographic Work

justed. The illuminator has its own optical system including a diaphragm which must be coordinated with the illuminating train of the spark generating equipment.

The spark generating equipment is mounted in a

\*Abstract of a paper, "An Introduction to Ultra-Violet Metallography," presented at the annual February meeting of the American Institute of Mining and Metallurgical Engineers in New York, Feb. 15. The author is a member of the technical staff, Bell Telephone Laboratories, Inc., New York.



case which is spaced 32 centimeters from the microscope stool. It consists of a wooden cabinet supported on a box to match. Two condensers and a safety spark gap are mounted in the bottom of the cabinet. On top is a T shaped adjustable optical bench carrying a diaphragm, a prism table, a collimator and the spark stand. The electrode terminals have a micrometer screw adjustment and both electrodes are opened or closed simultaneously so that the gap will function



*Hyper Eutectoid Steel Photographed with a 1.40 N. A. Objective of the Apochromatic System Using Blue Light of the Visible Spectrum. The magnification is 3500 times*

centrally before a quartz slit mounted on the frame of the spark stand. The electrodes are strips of cadmium or of magnesium.

Mounted on the end of the cabinet is a small mercury vapor lamp in a suitable metal housing. The flask mounted in front of the opening in the lamp housing is filled with a green filter solution, yielding approximately monochromatic light and is used as a condenser. This lamp assembly may be used in two ways. Either it may be swung around between the two units of the equipment and thus illuminate the vertical illuminator directly, or it may be swung back so that a small mirror reflects the light through the prism diaphragm. By this latter arrangement it is possible to center the illumination with the mercury vapor light by alining the optical system of the microscope with reference to the aperture of the prism diaphragm.

The mercury vapor lamp has another important function to perform. It provides a steady source of approximately monochromatic illumination, free from noise, by which the operator can focus the specimen, study its structure, and select a field as a preparatory step to photography with the ultra-violet illumination.

cadmium or the magnesium line, as the case may be.

The spark is generated by a step-up transformer, the output of which is regulated by a carbon plate rheostat in the primary winding. The injurious action which ultra-violet light has on the eyes is too well known to require an additional word of caution. In order to afford a maximum degree of protection an



*Same Specimen as Previous One but Photographed with Ultra Violet Light Using the 2.5 mm. Immersion Objective, 14 X Ocular and Cadmium Electrodes. The magnification is 1600 times. A crisp brilliant image has resulted which surpasses in resolution and quality anything achieved with the visible spectrum*

expanded metal cage has been constructed and lined with amber glass. This cage fits over the spark stand and has a hand hole for access to the electrode adjusting screw and also an aperture for the light to emerge to the collimator. This arrangement muffles the noise of the spark somewhat.

#### Precision of the New Light

The ultra-violet microscope is an instrument of far greater precision than any other microscopic apparatus available for metallography. It requires great exact-

ness of focus and the focus must be obtained by viewing an image on a fluorescent screen under an intensity of illumination which is in no wise comparable to that obtainable when working with the ordinary metallurgical equipments. In fact, the details of the image are just barely visible and some expedient must be employed to insure exact focussing as will be described later. It is not the case of sitting comfortably at a focussing screen and studying the minute detail of the

judged and compared with results obtained with the apochromatic system.

The illustrations are described (in the paper) by appropriate titles so that it will not be necessary to enter into a detailed discussion. The results obtained with ultra-violet light have usually tended toward "flat," "muddy" negatives showing little contrast and no brilliancy. The writer experienced this same sort of difficulty but found that the trouble was due in each case to one of two conditions or to a combination of the two—either the image was not in exact focus or else the illumination was not critical.

#### Selective Properties and Characteristics

Ultra-violet light has selective properties which should help to identify structures. It appears that certain constituents of hardened steel, for example, absorb ultra-violet light more readily than do other constituents. It is quite likely that this same characteristic will be found in connection with other metals. It is known that many colorless organic objects show the effects of selective absorption of ultra-violet light and, while they show no signs of color by white light, they respond to ultra-violet light as though colored.

The writer has made many observations of iron and steel structures and can report tentatively as follows with regard to the selective characteristics of ultra-violet light; the specimens were polished and etched in the usual way:

Austenite .....	Reflects ultra-violet light.
Probably untempered martensite.	Absorbs ultra-violet light to some extent, but much light appears to be reflected from individual needles. The needles photograph light.
Probably slightly tempered martensite .....	Absorbs ultra-violet light readily—the needles photograph dark.
Troostite .....	Absorbs ultra-violet light to a large extent. Troostite photographs almost black due to this selective absorption. No other constituent of hardened steel seems to absorb ultra-violet light as readily as troostite.
Sorbite .....	Shows less absorption than troostite but more than pearlite.
Pearlite .....	Reflects ultra-violet light.
Free carbides .....	Appear to reflect completely ultra-violet light.
Free ferrite .....	Appears to reflect completely ultra-violet light.

In concluding this introductory paper the writer can say that the ultra-violet microscope has lived up to expectations. Crisp brilliant images can be obtained which surpass in quality those obtainable with the apochromatic system. The potential resolving ability of the monochromats can be realized in practice and the practical application of the ultra-violet microscope should develop much new information. The ultra-violet microscope is the most complicated of any within the realm of technical or scientific microscopy. It requires a highly developed technique for its successful manipulation and the specimens must be prepared with great care. The ultra-violet equipment appears to have a potential resolving ability of the order of about twice that of the apochromatic system.



*Iron-carbon Alloy, Photographed With Ultra Violet Light Using 6 Mm. Objective; 14 X Ocular and Magnesium Electrodes. The magnification is 1050 times. Some martensitic needles absorb ultra violet light; others reflect it quite completely, the dark needles indicating absorption and the white needles reflection. The mid-ribs of some of the white needles are black, showing absorption of UV light and confirming by another means the writer's earlier conclusion that the mid-ribs or axes of the martensitic needles are more fully troostitic. Troostite absorbs UV light more readily than other constituents of steel. Where absorption is indicated the needles of martensite are believed to be more fully troostitic. Ultra violet light brings out slight polishing imperfections apparently quite invisible by ordinary methods. It was found necessary to improve preparatory methods*

image with a magnifier and making the exact focus which will accentuate the one characteristic of the structure which it is desired to portray. One must visualize the entire field and gage the state of focus by means of the small searcher eye-piece. The intensity of the illumination is hardly sufficient to do otherwise although the writer has experimented with various fluorescent screens in place of the usual focussing screen of the camera. He has concluded that the searcher eye-piece method is the most hopeful. [The author then discusses the various features of the apparatus and the method of its use; also the optical combinations and the day plates.]

The optical combinations possible with the equipment and the magnifications obtainable are given in Table III (in the original paper). The equipment is so designed that when the image is sharply in focus in the searcher, it will also be sharply in focus on the plate when the camera is set so that the plate will be about 30 cm. above the eye-piece. The time required for exposure will be doubled roughly, as the change from one to the next higher eye-piece is made.

At this time it is not the object to show the application of the ultra-violet microscope to the study of structures apparently irresolvable by other methods, but to describe the equipment and to illustrate the results obtained when photographing well-known structures. In this way the quality of the image may be

The annual directory of the iron and steel trade of France, "Annuaire 1925-1926," like its predecessor contains a list of all the members of the iron masters' organization, the Comité des Forges de France, and this means all of the steel making establishments of the country. The companies are listed alphabetically, also by geographical divisions, and information is given of chief personnel, nature of products, and at times something of the equipment. The various group associations in the industry are explained and a valuable part of the book is a detailed classified list of advertisements of manufacturers of apparatus, equipment and supplies. The book is sold at 50 fr. per copy, and may be obtained by addressing the Comité des Forges de France, 7 Rue de Madrid, Paris.

# Embrittlement in Malleable Castings\*

Simple Heat Treatment Developed to Prevent Brittleness  
Due to Hot-Dip Galvanizing

BY L. H. MARSHALL

MALLEABLE iron castings frequently are made brittle by hot-dip galvanizing. The castings may be and usually are perfectly normal before the hot-dip treatment, in that they will stand a remarkable amount of distortion and punishment before fracturing, yet, after galvanizing, a single blow with a hammer will often cause a break. It is felt, therefore, that a practical method of overcoming this embrittle-

the hot-dip, therefore its use has spread. A certain amount of embrittlement occurs even in sherardizing. The hot-dip galvanizing process is favored because of the attractive coating it produces. The greatest obstacle to its use in the case of malleable iron is the resulting embrittlement.

Another development concerns the composition of malleable iron itself. Not so long ago a large propor-

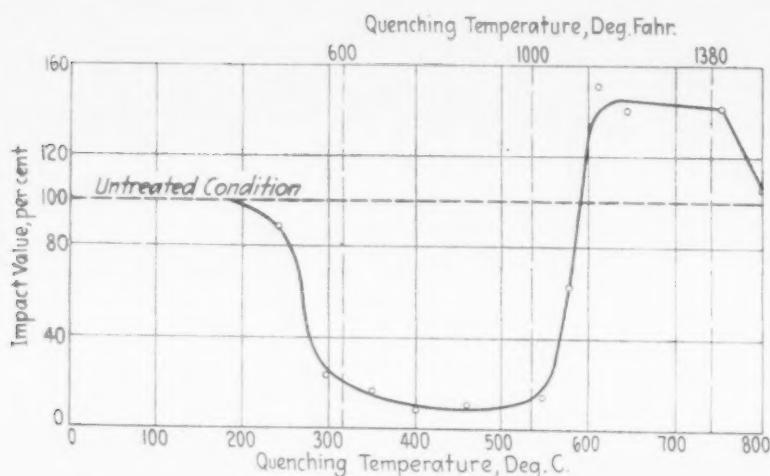
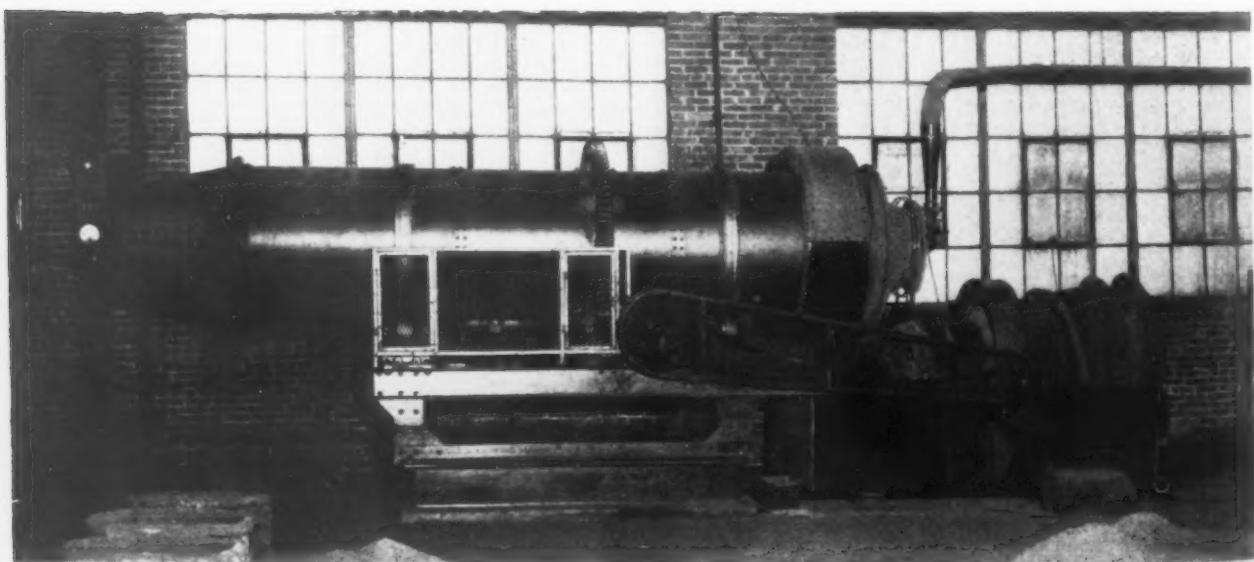


Fig. 1 (Left)—Variation of Impact Values of Specimens of Malleable Iron With Quenching Temperature

Fig. 2—Furnace and Equipment Used for the Heat Treating of Malleable Iron Castings Before Hot-Dip Galvanizing



ment, a method that has already been used on several thousand tons of castings, will be of general interest.

## Development of the Problem

There are several methods of applying zinc commercially, such as electrodeposition, spraying, sherardizing, and hot-dip galvanizing. There is probably little difference between good coatings by any method so far as effectiveness of rust prevention is concerned. Sherardizing, being inexpensive, is often employed. The embrittlement is not so severe in this process as in

tion of the malleable iron produced was of the high-carbon type. The physical properties of this material were not always of the best, so that the trade came to demand a metal of greater strength. Under the leadership of the American Malleable Castings Association the tensile properties were much advanced. This change, however, necessitated lower carbon compositions, which in turn entailed increased silicon content. While the strength was greater, this improved iron was not as reliable from the galvanizer's point of view, because the increase in silicon resulted in an increase in the tendency to become brittle.

With such incentive, it is not surprising that this problem has been studied by various investigators. A recent paper by Bean points out the important role

\*Abstract of a paper, "A Process for the Prevention of Embrittlement in Malleable Cast Iron," presented at the February meeting of the A. I. M. and M. E., in New York, Feb. 15. The author is metallurgist Ohio Brass Co., Mansfield, Ohio.

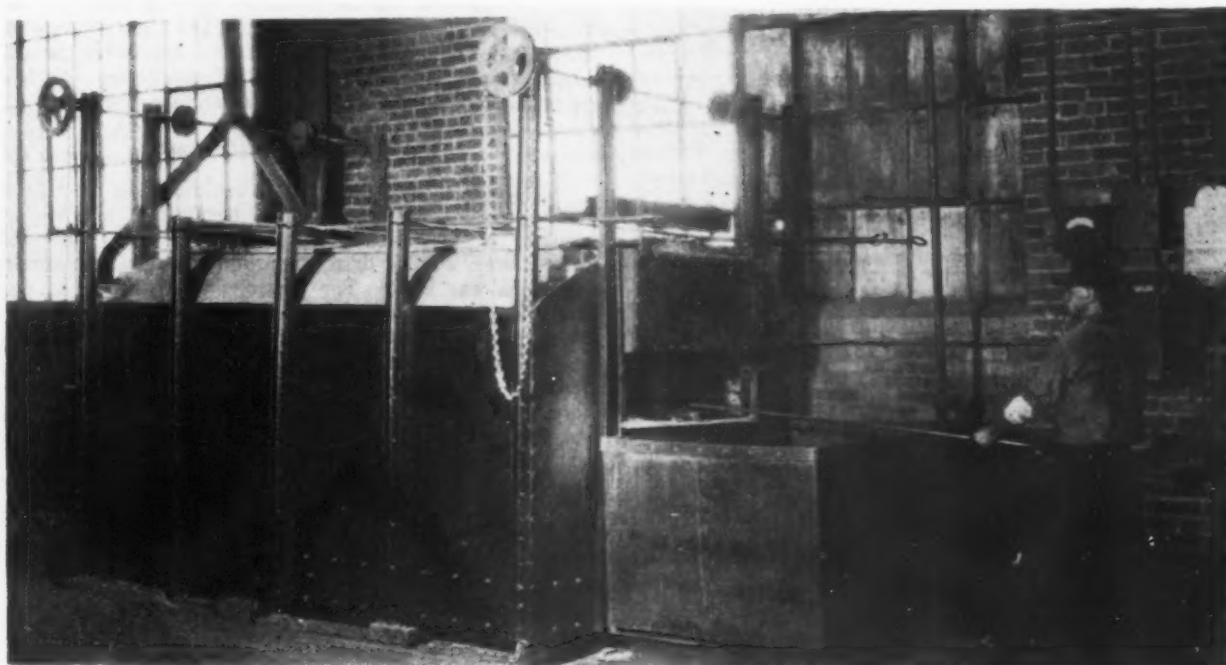


Fig. 3—Special Furnace for the Heat Treatment of Malleable Castings of Irregular Shape

played by composition. He clearly shows that increased silicon and phosphorus content enhance the tendency to become brittle in galvanizing. The present investigation, attacking the problem from an entirely different angle, corroborates many of Bean's results.

The present work was inaugurated before Bean's results were available and while information on galvanizing embrittlement was very limited. The first step was to isolate the factor in the galvanizing treatment that really produced the trouble.

#### Isolating the Cause of Embrittlement

To begin with, the castings must be clean and free from oxide and scale. They are immersed in molten zinc at about 860 deg. Fahr. (460 deg. C.) for a few minutes, removed and quickly cooled, often by quenching in warm water. A customary method of removing the sand and rust before treating the castings is to pickle off the incrustations in dilute acid solution. Since the occasional brittleness of galvanized steel sheet is often ascribed to the action of the pickling acid, this cleaning treatment seemed a possible cause of the trouble with malleable iron. Using the Izod impact test as a measure of the embrittlement, samples of pickled and non-pickled malleable iron were compared. The results showed conclusively that the cleaning treatment was not to blame.

It might be that the etching action of the molten zinc, by producing microscopic notches in the surface of the iron, could make the castings more susceptible to fracture. This hypothesis has to be abandoned, however, when experiments showed that the presence of zinc was unnecessary. So long as the malleable iron was heated to the galvanizing temperature and quickly cooled, the embrittlement was quite as marked as if the zinc bath were used. The temperature, about 860 deg. Fahr. (460 deg. C.), and the rapid cooling rate were the important factors.

Having discovered that quenching from the galvanizing temperature produced marked embrittlement, it was decided to investigate the effect of varying the temperature from which the pieces were quenched. A number of impact specimens were cut from the same piece of iron. Duplicate samples from this lot were heated to various temperatures and quenched in hot water. Their impact values were plotted against their quenching temperatures (Fig. 1). From this curve it is evident that there was a well defined range of temperatures, 570 to 1020 deg. Fahr. (300 to 550 deg. C.), quenching from which produced brittle metal. Another even more important feature of the curve is the high

impact values obtained on quenching from the zone 1100 to 1380 deg. Fahr. (600 to 750 deg. C.). In fact, treatment in this range gave better results than those obtained on the untreated malleable iron.

Since quenching from 1100 to 1380 deg. Fahr. gave such good results, it was decided to see if treatment in this range would overcome the galvanizing embrittlement. Tests soon showed that this hope was fulfilled. By heating to about 1200 deg. Fahr. (650 deg. C.) and quickly cooling, preferably quenching in water, any tendency to embrittle in galvanizing was eliminated. This treatment also served to reclaim any iron previously embrittled by galvanizing. The commercial heat treatment of thousands of castings has since testified to the validity of these results. The simple process of heating the annealed castings to this temperature and then quenching, permits the castings to be subsequently galvanized with the assurance that brittleness will not result. (The process is covered by United States patents 1,553,907 and 1,553,908.) In fact, the cooling rate from the elevated temperature may vary widely without any noticeable effects. Extremely slow cooling is to be avoided, however, because erratic results are sometimes secured. Quenching has also the superiority of speed, in that the material is cool enough to be handled shortly after its removal from the furnace.

#### Added Advantage of Heat Treatment

Another advantage is secured by this heat treatment which makes the process doubly valuable. Since this feature has to do with a property of malleable iron that has not been widely recognized, it may be well to include some specific data on the subject. A number of impact specimens, 0.5 in. (12 mm.) sq. by 5 in. (120 mm.) long, from the same heat and anneal of commercial malleable iron were used for these tests. Their composition was : Carbon 2.65, silicon 0.91, manganese 0.40, sulphur 0.067, phosphorus 0.16 per cent. Half of these samples were heated to about 1240 deg. Fahr. (670 deg. C.) for 20 min. and quenched in water. The treated and untreated specimens were each divided into two lots, one of which was galvanized. The zinc bath was at 860 deg. Fahr. (460 deg. C.) and from this the pieces were quenched in water at 195 deg. Fahr. (90 deg. C.). They were then machined to size for the regular Izod impact specimens with 45 deg. V-notch. Half of these pieces were tested at room temperature, 71 deg. Fahr. (21 deg. C.) and the other half at 20 deg. to 25 deg. below zero Fahr. (-29 deg. to -31 deg. C.). The low temperatures were secured by immersing the specimen and the clamping jaws of the

Izod machine in alcohol cooled with carbon dioxide snow. The values given in the accompanying table are, in each case, the average of three results.

Specimens	Impact Value			
	At 71° F.		At -20° F.	
	Ft. Lb.	Per Cent	Ft. Lb.	Per Cent
Untreated . . . . .	7.4	(100) <sup>a</sup>	1.9	(26)
Galvanized . . . . .	1.0	(14)	0.6	(8)
Quenched from 1240° F. . . . .	8.6	(116)	7.6	(103)
Quenched from 1240° F. and galvanized . . . . .	7.9	(107)	7.2	(97)

<sup>a</sup> In parenthesis are given the percentage values as compared with untreated material at room temperature.

This table shows clearly that, for the material investigated, the low temperature produced brittleness in the untreated iron even before it was galvanized. On the other hand, the heat-treated iron was galvanized and severely cooled without serious deterioration. These results have been checked on other melts of malleable iron and while the contrasts have not always been as great as in the above case, the general trend was the same.

#### The Process in Practice

After laboratory experiments had clearly demonstrated on a small scale that the heat treatment described gave a uniformly good product, the next step was to introduce the process in the plant on a production basis. The first furnace installed was a Rockwell rotating, oil-fired furnace with a heating chamber 15 ft. long. The castings, taken directly from the annealing pots, were shoveled in at one end and automatically carried through the chamber, dropped into a water quenching-tank and then conveyed out to a container at the other end. With such a furnace one man handled about 300 castings, weighing 3 lb. each, in an hour.

The experience gained with this furnace has shown that, by exercising reasonable care, excellent results can be readily and consistently secured. It is essential that the process be under pyrometric control. The thermo-couple tip should be located at the point where the castings are submitted to the highest temperature. This temperature must be maintained between 1200 and 1380 deg. Fahr. (650 to 750 deg. C.). Such a range is ample to render the treatment easily practicable. There is no danger of deterioration if the castings remain in the furnace too long, provided the correct fur-

nace temperature obtains. If the temperature goes too high or too low, brittle castings with a light-colored fracture are likely to result. With too high a temperature the graphitic carbon starts to redissolve at the grain boundaries; with too low a temperature the embrittlement that characterizes galvanizing results.

#### Handling Irregular Shapes

Castings of irregular shape could not be processed in the original rotating furnace because of a tendency to ball together and clog the machine. To care for such pieces, the oil-fired, semimuffle furnace pictured in Fig. 3 was built. The castings are piled in at one end and, as they come up to temperature, are pushed through and out at the other end, falling into the quenching tank. A pyrometer permits a definite temperature to be maintained at one point within the furnace, but the operator must decide when the castings are heated through and ready to be quenched. This point is easily recognized. Consistently good results are being secured from the use of this furnace even with an unskilled laborer as operator.

Soon after the introduction of this heat treatment as a regular manufacturing process, it became evident that the resulting improvement in quality warranted the extension of the treatment to all the malleable iron produced whether or not it was to be zinc coated. The increased capacity thus required was secured by the installation of an additional and larger Rockwell furnace. This is 20 ft. long and has an hourly capacity of 2400 lb. of castings. It is even more satisfactory than its smaller counterpart.

The heat treatment of malleable iron has been a regular manufacturing process with The Ohio Brass Co. for more than two years. More than 8000 tons of castings have been treated and galvanized, with an almost negligible loss from embrittlement. For instance, with one type of casting, very piece of which was tested after galvanizing, the loss during this entire period was 0.6 per cent. Before the special heat treatment was employed, losses on this casting ran from 20 to 40 per cent. The yearly saving on this one item alone has amounted to over \$100,000. Such possibilities in monetary saving, together with the decided improvement in quality of product, mark the process as highly important.

#### Quarter Billion in Wages Lost Annually Because of Illness

Medical service in industry, upon which American manufacturing establishments are spending millions yearly, is proving a paying investment, yielding valuable dividends in health, in stability of employment and in elimination of waste, according to a report prepared by the National Industrial Conference Board, 247 Park Avenue, New York. It is conservatively estimated that American wage-earners lose \$250,000,000 a year in wages through absence due to illness. To this, the report points out, must be added to the loss to the individual workers not in perfect health, who, if entirely well, might in many cases increase their earnings considerably by being able to do more valuable or entirely different and more remunerative work.

The loss to workers in wages, however, it is pointed out, is only part of the economic loss involved. Industry loses by decreased output and increased labor turnover; trade loses through the worker's decreased purchasing capacity, and every consequence of illness, cultural, physical and economic is reflected in the diminished health and happiness of the community life.

The economic loss caused by illness is exemplified in the conference board's report by the experience of one typical New England plant employing an average of 4500 workers. Illness at one time or another during one year, averaging 1½ weeks per employee, cost the company in lost time, transfers and lay-offs, and reduced production on part of those working but not in good health, at total of \$267,500; the workers lost a total of \$202,000 in wages, spent another \$45,000 in

medical, surgical and nursing expense, while their disabilities entailed another \$56,000 of expense in charitable relief and care, a total loss to the community of \$570,500 in one year's time.

Among 500 industrial plants covered by the conference board's study 447 reported total annual expenditures of more than \$5,000,000 for medical service rendered to their employees, yet the average annual expenditure amounted to only \$1.03 for each \$1,000 worth of products, or \$3.62 for each \$1,000 paid out in wages.

#### Automobile Production Seasonally Low But Well Above Last Year

WASHINGTON, Feb. 23.—Totaling 271,231, production of passenger automobiles in January in the United States was the lowest since September, 1925, when the total was 262,053. Production of passenger cars in Canada in January was 11,252, as against 7498 in December. Production of trucks in the United States in January of the present year, numbering 29,601, was the lowest since January, 1925, when the total was 26,576. Canada produced 2910 trucks in January, 1926, as against 1731 in December, 1925.

Both trucks and cars showed a heavy increase in January over the first month of 1925. Cars gained 66,611, or 32.6 per cent, over the 204,620 of a year ago; trucks, 3025, or 11.4 per cent. Canadian output showed similar gains. For twelve months ended Jan. 31, United States production of cars, at 3,744,939, and of trucks, at 478,051, was the highest ever reached for any twelve consecutive months.

## International Trade Exposition

### New Orleans Project, a Non-Profit Making and Cooperative Institution, to Foster Foreign Trade, Now Open

The International Trade Exposition at New Orleans, La., which has the support of the Congress of the United States and is indorsed and promoted by the New Orleans Association of Commerce, the Cotton Exchange and other business organizations of that city, is now open to the public and the buyers of the world have been invited to attend. The exposition is a non-profit making and cooperative institution and will devote any

markets, etc., and such other information as may prove effective in stimulating a free interchange of commerce.

An announcement by the exposition officials says in part:

"The Latin American countries are evincing a great interest in this cause and a number of them have already arranged to make a display of their natural resources. This will make possible a direct contact point here with the Latin American trade, which is growing rapidly and now represents nearly one-fourth of the entire export business of the United States.

"We know this movement will mark a new era in marketing; it will not only bring the buyers and sellers into the atmosphere of trade but will keep them in



*S. Odenheimer, President and Director of International Trade Exhibition*

*A Large Crowd Was Attracted to the Exposition Building on the Opening Day*



surplus funds over the expenses of operating to advertising and exploitation.

The Congress of the United States on March 3, 1925, adopted a resolution commending the undertaking and President Coolidge on the following March 13 issued a proclamation inviting the States of the Union and all foreign countries to participate by exhibiting samples of their fabricated and raw products. The United States Government has cooperated further in turning over by a special act of Congress the Quartermaster's Depot at New Orleans rent free, and this building, with its 450,000 sq. ft. of floor space, is now available to exhibitors, many of whom have leased space.

Special services are available to exhibitors such as interpreters, credit information, advice on transportation problems, tariffs, packing of goods, locating new

touch with the improvements and progress made in their lines. It will give the buyer of fabricated materials the opportunity of actually making a physical comparison of the products on display in which he is interested, thereby enabling him to get what is best suited to his needs; while on the other hand, the buyer of raw materials through actual comparison may secure what will best meet his requirements. The expenditure of time and money required in making such comparisons now in most cases is prohibitive.

"For the time being free steamship transportation is offered to bona fide merchants and industrials of the Latin American countries, certified to by the proper consular officer at the port of embarkation. The only condition is that they will visit the exhibition and arrive and leave by steamer from the port of New Orleans."

## Immigration of Last Half Year

### Small Gains Among Workers for Metal and Metal-Working Trades

WASHINGTON, Feb. 23.—Aliens admitted to the United States for the last six months of 1925 totaled 243,961, while the number departing amounted to 127,612, leaving a net increase of 116,349. Of the inward movement, 144,148 were classed as immigrants, while of the outgoing movement 46,592 were classed as emigrants, leaving an increase of 97,556.

During this period Canada and Mexico provided by far the greater part of the total net immigration to the United States, 59,137 immigrants coming from these countries against only 2829 departed. Canadian immigration, however, has dropped nearly 25 per cent compared to the same months of the previous year.

Immigration from Europe increased 15 per cent, principally from northwestern Europe, with Germany furnishing the greatest number and the Irish Free State second, while the exodus of aliens to Greece, Italy, Portugal, Spain, and Jugoslavia has been greater

by 15,000 than the immigration from these southern European countries.

For the entire six months the total number of incoming iron and steel workers, according to the Bureau of Immigration, Department of Labor, was 634, while the departing iron and steel workers during that period was 72, leaving a net gain of 562. The number of metal workers other than iron and steel that were admitted to the United States during that period was 210, while the number departing was 33, leaving a net increase of 177. The number of incoming machinists was 946, while the number departing was 342, leaving a net increase of 604.

The Weirton Bridge Co. has been organized by Frank D. Sinclair, Steubenville, Ohio, banker, and associates, and congress has been petitioned for permission for the construction of a vehicle and foot traffic bridge over the Ohio River to connect Weirton, W. Va., and Steubenville. Several years ago congress authorized the Steubenville-Pittsburgh Bridge Co. to erect a span near the present bridge of the Pennsylvania Railroad from Wheeling Junction to Steubenville, but that company failed to act.

# European Furnaces Well Booked

Pig Iron Demand Heavy But Consumers of Steel Await Return of Charleroi Mills—  
Krupp Works Curtails Operation

(By Cable)

LONDON, ENGLAND, Feb. 22.

PIG iron is quiet with domestic consumers well covered temporarily and disinclined to purchase for forward delivery. Prompt supplies of Cleveland grades are scarce. Export trade continues poor. The hematite market is steady with a good volume of export sales but domestic demand is light. Foreign ore continues quiet and Bilbao Rubio is still about 21s. 3d. to 21s. 6d. c.i.f. Tees.

Finished steel inquiry is broadening as a result of recent shipbuilding contracts involving sizable plate tonnages but business otherwise is still dull. Some activity in rails has appeared, Dorman, Long & Co. securing 25,000 tons of 100-lb. sections from the Buenos Aires & Great Southern in Argentina.

Tin plate is steadier as a result of the absorption of some low-priced tonnages recently in the market, but business generally is still poor. Galvanized sheets are moderately active in the heavier gages and makers are quoting April as the earliest delivery. Black sheets are quiet.

Continental markets are generally inactive. British users of Continental semi-finished products are well-covered and consumers of finished materials are not inclined to purchase at present, expecting a moderate reduction of prices when the Charleroi plants re-enter the market. The expected lower prices may not develop, however, as some Charleroi mills sold up to the end of April during the closing days of the strike. Ougree-Marihaye in Belgium is starting a large new wire mill about March 1. In Germany, Fried. Krupp & Co. are dismissing 1300 more workers. French, Luxembourg and Belgian foundry pig iron producers have temporarily abandoned the idea of an international pig iron syndicate but have agreed on the necessity of uni-

form sales methods, classification and terms of payment and have established a price for foundry pig iron at 340 to 345 fr. (Belgian) f.o.b. Antwerp.

## Belgian Prices Weak

Some Mills Full While Others Offer Rebates—  
Pig Iron Decidedly Strong

BRUSSELS, BELGIUM, Feb. 5.—Lack of confidence is restricting business so that prices are in most cases being barely maintained and the future is uncertain. The unevenness of the present market is reflected in the varying attitudes of different mills. While a few that are well booked with business are refusing all rebates and concessions, others less desirably situated are inclined to shade on any specification at all desirable. Purchases are still being deferred in expectation of a still further development of the downward tendency of prices, current business being confined to the minimum of immediate requirements. Export prices of all mills are at about the same level.

**Pig Iron.**—With most of the furnaces heavily committed for the first quarter, pig iron prices are firm and a large export demand is developing a strong undertone to the market. No. 3 foundry is quoted at 320 to 330 fr. (\$14.53 to \$14.98) per metric ton to domestic consumers and 335 to 345 fr. (\$15.20 to \$15.65) per metric ton, c.i.f. Antwerp for export.

**Semi-finished Material.**—Although available supplies of blooms, billets and largets are exceedingly small, purchasers are consistently refusing to meet the price ideas of mills, possibly because of the expected effect on the market of the return to production of the Charleroi mills. Billets are fairly firm at £4 8s to £4 11s (\$21.30 to \$22.11) per metric ton f.o.b. Antwerp but blooms are still weak at £4 1s to £4 2s (\$19.68 to \$19.92).

British and Continental European prices per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at \$4.86 per £ as follows:

Durham coke, del'd.	£1 18	\$5.10
Bilbao Rubio ore	£1 11 $\frac{1}{2}$	5.22
Cleveland No. 1 fdy.	3 12 $\frac{1}{2}$ and £3 13s.*	17.62 and \$17.74*
Cleveland No. 3 fdy.	3 10 and 3 10 $\frac{1}{2}$ *	17.01 and 17.13*
Cleveland No. 4 fdy.	3 9 and 3 9 $\frac{1}{2}$ *	16.77 and 16.88*
Cleveland No. 4 forge	3 8 and 3 8 $\frac{1}{2}$ *	16.52 and 16.65*
Cleveland basic	3 16 and 3 10 $\frac{1}{2}$ *	17.01 and 17.13*
East Coast mixed	3 18 to 3 18 $\frac{1}{2}$	18.95 to 19.08
East Coast hematite	4 19	24.06
Ferromanganese	15 10	75.33
*Ferromanganese	15 5	74.12
Rails, 60 lb. and up.	7 5 to 8 0	35.24 to 38.88
Billets	6 0 to 7 10	29.16 to 36.45
Sheet and tin plate bars, Welsh	6 5	30.38
Tin plates, base box	0 19 $\frac{1}{4}$ to 0 19 $\frac{3}{4}$	4.68 to 4.80
Ship plates	7 2 $\frac{1}{2}$ to 7 12 $\frac{1}{2}$	1.54 to 1.65
Boiler plates	11 0 to 11 10	2.39 to 2.49
Tees	7 7 $\frac{1}{2}$ to 7 17 $\frac{1}{2}$	1.47 to 1.71
Channels	6 12 $\frac{1}{2}$ to 7 2 $\frac{1}{2}$	1.44 to 1.55
Beams	6 7 $\frac{1}{2}$ to 6 17 $\frac{1}{2}$	1.40 to 1.50
Round bars, $\frac{3}{4}$ to 3 in.	7 17 $\frac{1}{2}$ to 8 7 $\frac{1}{2}$	1.71 to 1.81
Steel hoops	10 10 and 11 0*	2.28 and 2.49*
Black sheets, 24 gage	11 5 to 11 10	2.35 to 2.49
Black sheets, Japanese specifications	14 15	3.19
Galv. sheets, 24 gage	16 0 to 16 5	3.47 to 3.52
Cold rolled steel strip, 20 gage	18 0	3.91

\*Export price.

†Ex-ship, Tees, nominal.

## Continental Prices, All F.O.B. Channel Ports

Foundry pig iron: (a)				
Belgium	£3 2s.	to £3 4s.	\$15.06	to \$15.55
France	3 2	to 3 4	15.06	to 15.55
Luxemburg	3 2	to 3 4	15.06	to 15.55
Basic pig iron: (a)				
Belgium	3 0	to 3 2	14.58	to 15.06
France	3 0	to 3 2	14.58	to 15.06
Luxemburg	3 0	to 3 2	14.58	to 15.06
Coke	0 18		4.37	
Billets:				
Belgium	4 11	to 4 12	22.11	to 22.36
France	4 11	to 4 12	22.11	to 22.36
Merchant bars:			C. per Lb.	
Belgium	5 7	to 5 10	1.18	to 1.21
Luxemburg	5 7	to 5 10	1.18	to 1.21
France	5 7	to 5 10	1.18	to 1.21
Joists (beams):				
Belgium	4 19	to 5 2 $\frac{1}{2}$	1.09	to 1.13
Luxemburg	4 19	to 5 2 $\frac{1}{2}$	1.09	to 1.13
France	4 19	to 5 2 $\frac{1}{2}$	1.09	to 1.13
Angles:				
Belgium	5 2	to 5 4	1.12	to 1.15
1 $\frac{1}{2}$ -in. plates:				
Belgium	6 2	to 6 4	1.34	to 1.36
Germany	6 2	to 6 4	1.34	to 1.36
3 $\frac{1}{2}$ -in. ship plates:				
Belgium	5 12	to 5 14	1.23	to 1.25
Luxemburg	5 12	to 5 14	1.23	to 1.25
Sheets, heavy:				
Belgium	6 3	to 6 4	1.35	to 1.37
Germany	6 3	to 6 4	1.36	to 1.37

(a) Nominal.

per metric ton. Largets are quoted at £4 14s to £4 16s (\$22.84 to \$23.32) per metric ton, f.o.b. Antwerp.

**Finished Material.**—The only apparent change in the market on steel bars is a slight undertone of weakness. Iron bars are slightly firmer as a result of the fairly satisfactory demand. Beams are quiet and unchanged. Steel bars are quoted at 585 to 590 fr. (\$26.45 to \$26.78) per metric ton to domestic consumers and about £5 6s 6d (\$25.88) per metric ton, f.o.b. Antwerp for export. Beams are unchanged at 575 fr. (\$26.10) for domestic consumers and £4 17s 6d to £4 19s 6d (\$23.70 to \$23.95) per metric ton, f.o.b. Antwerp for export. Angles are held at 580 to 590 fr. (\$26.33 to \$26.78) for domestic consumption and £5 6s to £5 6s 6d (\$25.75 to \$25.88) f.o.b. Antwerp for export.

**Rails.**—Domestic purchases have provided rail mills with some good tonnage and the domestic market is being maintained at 595 fr. (\$27.00) per metric ton while export tonnages are quoted at about £5 10s (\$26.75) per metric ton, f.o.b. Antwerp.

**Wire Rods.**—Prices are showing more strength and the domestic market is quoted at about 600 fr. (\$27.25) per metric ton. For export, £5 15s to £5 16s (\$27.95 to \$28.18) per metric ton, f.o.b. Antwerp, is generally quoted.

**Sheets.**—Mills are endeavoring to advance prices but are meeting with considerable resistance from purchasers, particularly on heavy and medium gage sheets, on which there is keen competition from German mills. The volume of business continues small, but on the whole the market is more stable than for some time. Light gage sheets are quoted at 1075 to 1100 fr. (\$48.80 to \$49.95) per metric ton to domestic consumers and at about £10 5s to £10 7s 6d (\$49.80 to \$50.30) per metric ton, f.o.b. Antwerp for export.

## Steel Importers Active

### Fair Tonnage Booked in Bars and Shapes—Rise in Yen Aids Japanese Trade

NEW YORK, Feb. 23.—Sellers of European steel to American consumers have been quite active in the past week or two, principally quoting on small inquiries and booking orders for a few hundred tons each. There are reports of some sizable purchases of Continental wire products, including barbed wire and nails, but such sales have evidently been more in the South and on the Pacific Coast than in the North.

The inquiries for rails, on which European prices are being considered, such as the reported inquiry of the Florida East Coast for 10,400 tons of 56-lb., 60-lb. and 80-lb. sections and that of the Boston & Maine Railroad for 10,000 to 15,000 tons of rails are still unplaced. The list of 5000 to 6000 tons of high-carbon special rails for the Interborough Rapid Transit Co. has not yet been awarded but it is reported that an order for 1500 tons of these rails was offered to an importer representing a large German interest and refused. The mill, which had quoted on the full quantity, claimed that it would be unprofitable to cut the necessary rolls for a smaller tonnage, although \$1 or more a ton is said to have been offered.

Current quotations on European reinforcing bars are from 1.73c. to 1.78c. per lb. base, c.i.f., duty paid. To this may be added about 5c. per 100 lb. for intermediate Thomas grade, an additional 5c. for size extras and 5c. to 10c. per 100 lb. for open-hearth steel.

### Exchange Situation Checking Japanese Buying

With the exchange value of the yen rising rapidly Japanese consumers are inclined to defer purchasing with a view to still greater advantage as a result of the higher exchange. In addition, the new tariff bill is still under discussion in the Diet and its exact form when passed is indefinite.

Recent purchases have included about 350 tons of electrical sheets bought by the Shibaura Engineering Co. through Mitsui & Co., New York. The Imperial Government Railways has finally awarded the 120 tons of bridge material and the 500,000 ft. of gas pipe for which it has been in the market for some time. The

bridge material was placed with an American mill through Mitsui & Co., which also booked about one-half the gas pipe, placing it with a French maker. The other half of the gas pipe went to the Mitsubishi Shoji Kaisha, New York, and was awarded to a prominent American mill. Of the total of about 65,000 boxes of oil can tin plate placed by the Nippon Oil Co. in the United States, the greater part is understood to have gone to the leading interest and a smaller tonnage to a West Virginia tin plate mill.

Inquiries from Japan, bids on which will be opened in a few days, include two rail specifications, each for about 25 miles of 75-lb. rails (about 3000 tons); one from the Nankai Railway Co.; the other from Osaka municipality.

### Sweden's Export Trade Good, But Domestic Market Quiet

STOCKHOLM, SWEDEN, Feb. 7.—Mills producing high quality products for export are booking a fair volume of business, but manufacturers of low-priced products for the domestic market are unable to secure sufficient business to maintain an even moderate scale of operation. In addition to the combination of certain mills in syndicates or corporations, other remedies suggested for this depression are increased import duties and the adaptation of all works to the production of high quality products for export. The latter change, however, would necessitate the expenditure of considerable capital, which in turn would require a higher tariff and the present government is opposed to increased import duties. The labor situation is fairly satisfactory, unemployment figures at the end of last year totaling only 20,300 compared with the high point in 1922 of 163,000.

In the iron and steel industry, the iron ore mines are the only prosperous branch. Exports of ores in 1925 had a value of 154,600,000 crowns compared with 108,210,000 crowns in 1924. In December there were in operation only 30 per cent of the blast furnaces, and about 25 per cent of the Lancashire iron open-hearth furnaces, 61 per cent of the Bessemer converters, 51 per cent of the open-hearth furnaces and 43 per cent of the electric steel furnaces.

While exports of iron and steel declined to less than half the pre-war tonnage, imports registered a decided increase. The total exports of ore from Sweden in 1925 were close to 9,000,000 metric tons compared with only 5,948,000 metric tons in 1924.

### Agreement on Seamless Pipe

#### Makers of Germany, France, Belgium, Poland and Czechoslovakia Aim to Establish Uniform Export Prices

WASHINGTON, Feb. 23.—Efforts of foreign producers of iron and steel to build up domestic and export markets and to control prices and distribute orders are reflected in reports received during the past week by the Department of Commerce. The outstanding movement concerned the conclusion of an agreement at Frankfort, Germany, among German, French, Belgian, Polish and Czechoslovakian representatives of the seamless iron and steel pipe industry. This has for its chief purpose the establishing of uniform sales prices in export trade. The duration of this entente, according to a report received by Trade Commissioner Daniel J. Reagan, Paris, is fixed provisionally until June, 1926.

In Spain a company known as La Central Siderurgica has been formed at Madrid with a capital of approximately \$150,000, subscribed to by Spanish iron and steel producers, for the purpose of regulating prices and of distributing orders among its members under a system similar to that in operation under the old German cartels. The report points out that this amalgamation, representing 96 per cent of the iron and steel capacity in Spain, at last brings together two important groups, but it is observed as being significant that the German Krupp interests in Spain are not included in this combination.

# How Nash Flywheels Are Machined

Four Turning Operations, Two Roughing and Two Finishing, Done Automatically on Four Machines—High Output Claimed

INCREASED production, lowered cost and the maintenance of high accuracy are claimed for the method employed in the turning of flywheels at the Milwaukee plant of the Nash Motors Co., which method is described in a recent monograph on "How Nash Flywheels Are Made," by Frank Edwards, Madison, Wis.

These flywheels are turned on four of the Gisholt Machine Co.'s, Madison, Wis., Simplimatics, which are simple automatic lathes designed for either chucking or between-centers work. Each machine performs a complete operation automatically.

The general arrangement of the machine may be noted from Fig. 1. Simplicity of construction and operation are features, and the bed of the machine, the table, the ways on which it moves and the tool slides are of liberal weight and dimensions comparable with machines of much greater swing. Multiple tooling equipment is carried by simple tool holders mounted on independent slides which receive their power through horizontal drive shafts. Universal joints in the drive shafts facilitate the setting of the tool-slides in any position which the work may require. The large tool-holders make possible the use of correspondingly large cutting tools which can be brought so close to the work that there is practically no overhang, each tool being

supported directly below its cutting edge. By using templates the tools are quickly and accurately set. The rigidity of the machine is claimed to eliminate vibration, which, in turn, prolongs the life of the cutting edges of the tools. The four machines used by the Nash company are identical except for the tooling equipment.

The Nash flywheel is of cast iron, is 14 in. in diameter and weighs 80 lb. Four operations are used to complete the wheel and each of the four Simplimatics performs one of these operations. After the flywheel has been chucked and the machine started, the operation is completed, the cutting tools returned by quick traverse to the starting position, and the spindle stopped, all automatically. The rate of feed is regulated so that each tool-slide is given the feed best suited to the kind and length of cut it has to perform.

A thorough understanding of the method of turning may be had from a study of each operation and the tooling equipment used. The tooling arrangement for the first operation which rough cuts one side of the wheel is shown in Fig. 2. In this operation eight surfaces are machined simultaneously. The eight tools used to do this work are carried in four tool-holders mounted on two tool-slides both of which move simultaneously

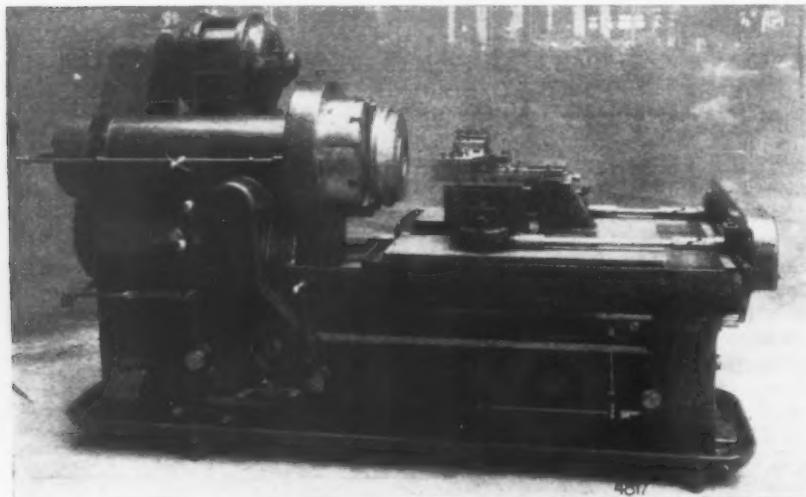
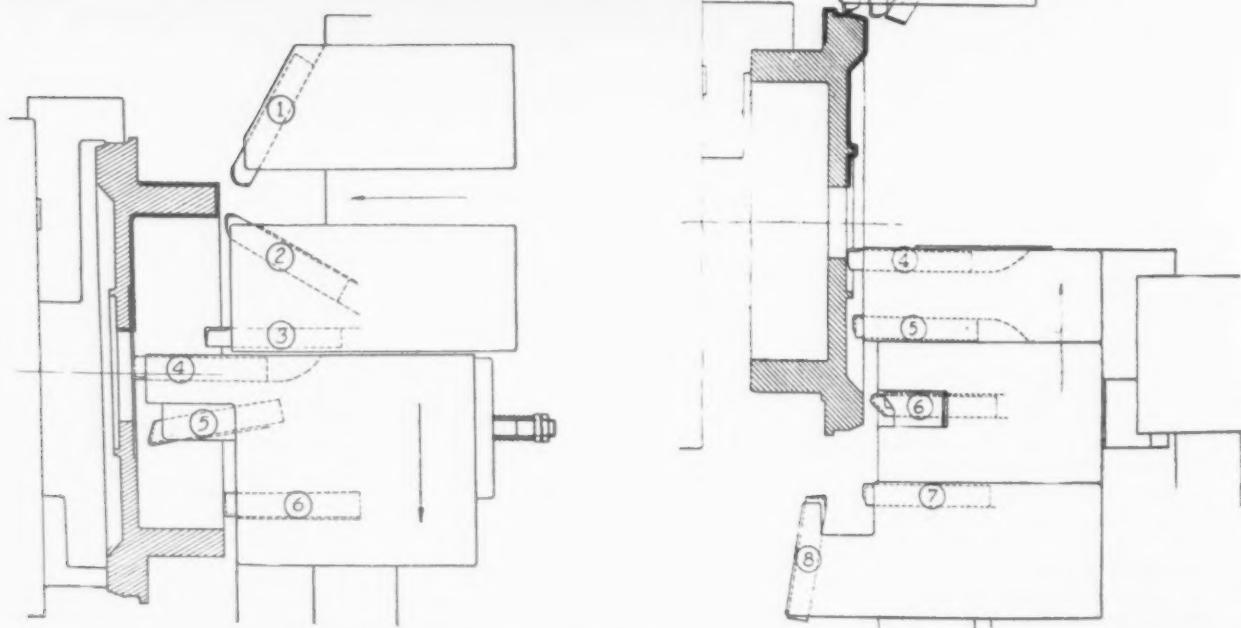


Fig. 1—Front View of Simplimatic, Four of Which Are Employed in Machining the Flywheels

Fig. 2 (Below) — Tooling Arrangement for First Operation. Eight surfaces are machined automatically

Fig. 3 (Lower Left) — In Second Operation the Reverse Side of the Flywheel Is Roughed



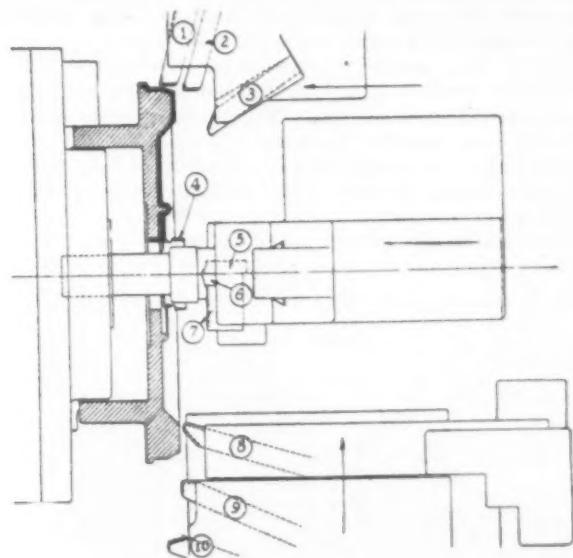
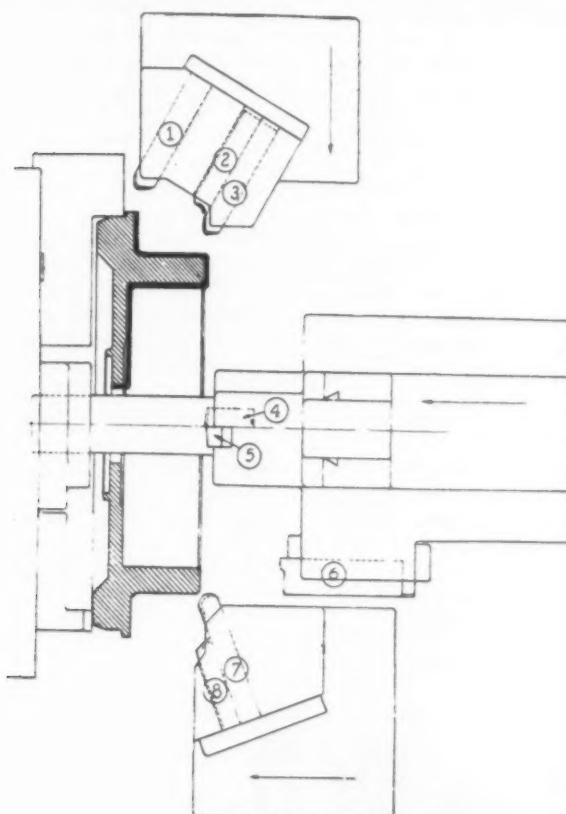


Fig. 4 (Left)—Tooling Arrangement for Third Operation, in Which the Face, Roughed on the Second Machine, Is Finished. Eight tools are employed

Fig. 5 (Above)—Ten Tools Are Used to Complete the Fourth and Last Operation. This set-up resembles closely that of operation No. 1

but independently of each other. On the diagram (Fig. 2), the surfaces roughed are shown by shaded lines. Each tool is numbered, and the direction in which each tool moves is indicated by the arrows.

In the simultaneous cutting of so many surfaces, states Mr. Edwards, will be seen the reason for using a machine designed for heavy duty and having all its moving parts so rigidly constructed and positive in operation that the exact relation of the tools to the work and to each other is maintained at all times. Air chucks are used on all four machines and provide a simple means of holding the flywheel.

In the second operation the reverse side of the flywheel is roughed. Six tools are used, the tooling set-up being shown in Fig. 3. The surfaces roughed are shown by the shaded portion of the drawing. The principles underlying this operation are identical with those used in operation No. 1. The next operation, performed on the third machine, finishes the face which was roughed on the second machine. It will be seen from Fig. 4 that eight cutting tools, including two cutters in the boring bar, are used. The fourth and last operation takes the remaining finishing cuts, Fig. 5 showing the details of this operation. Ten tools are used to complete it. With one or two exceptions

shown on the diagram this operation and set-up resemble very closely operation No. 1.

In the sequence of operations described above it will be seen that all roughing cuts are completed before any finishing cuts are taken. This fact together with the interval of time incident to moving the work from one machine to the next are stressed as assuring high accuracy in the finished piece, with maximum production.

Two machines are tended by one man, who chucks the castings and removes the finished work. He also sharpens the tools and resets them. An extra supply of sharpened tools is kept on hand so that production will not be delayed by tool changes. The time required to complete each operation is 4 min.

The table of the Simplimatic is large and heavy, moves on flat, wide ways and is capable of carrying any one of many different tool set-ups. The maximum number of cutting tools is used on each job and the application of an individual machine to each job is emphasized by the makers as giving the production of a machine solely designed for that particular job. It is claimed that the Simplimatic has the power, rigidity, simplicity and production capacity of specially built, single-purpose machines, but without their limitations.

### Universal Cutter and Reamer Grinder with Automatic Features

The automatic universal cutter, reamer and tap grinder illustrated, known as the Sickle, is being placed on the American market by L. Sichel, 6 Cliff Street, New York. Two sizes of the machine are available, the larger, designated as the No. 2 being here shown. Both machines have the same automatic features, but in the case of the smaller grinder, the No. 1, the table cannot be set at an angle nor can a universal head be furnished.

Adjustments in setting up are conveniently made by micrometer screws to graduations. The machine is intended for rough and finish grinding, regrinding or sharpening milled or relieved plain, side and formed milling cutters, end mills, etc., with either straight or spiral gashes. Reamers and taps, straight or spiral,

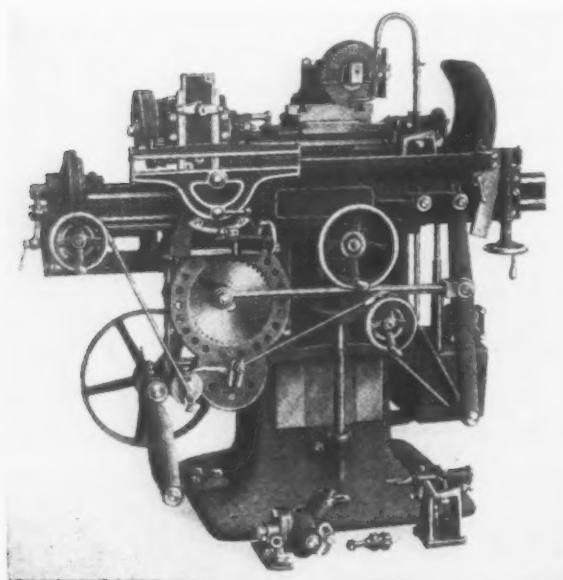
fluted and plain or taper, hobs, rotary knives, etc., may also be ground. The machine is designed to grind on both sides of side and face mills as well as on the circumference of tools. It is claimed that the machine can be used effectively not only in sharpening and regrinding but for manufacturing operations, taking the place of a relieving lathe for finishing to gage new cutters, excepting formed tools, that have been roughed out on a miller. High accuracy is claimed.

All movements, excepting chucking, stopping and unloading, are automatic. The work spindle during grinding is in no positive connection with gears in mesh. The automatic indexing is accomplished by accurately ground notched plates corresponding with or being multiples of the flutes of the tool. The spiral lead is generated by a "sine bar" conveniently set to exact right or left helix, no change gears nor racks being used. Quick setting by micrometer screw to graduation and

accurate following of helix angle is a feature stressed. The taper for long tools is obtained by table setting (hand wheel and microscrew to graduation).

Feeds are positive, automatic and adjustable. Peripheral feeds for sharpening on the face of the teeth, vertical feeds for deepening gashes, clearance, regrinding, etc., operate on table return stroke and give compensation for wheel wear. This is said to leave teeth equidistant, of same height and to give true radial cut or whatever the adjustment may call for. Lathe centers can be ground on the machine.

The wheel spindle is self-compensating and by a



*All Movements Except Chucking, Stopping and Unloading Are Automatic. The machine is intended not only for sharpening and regrinding but also for manufacturing operations*

combination of metals and suitable design, is said to counteract extension by heating. Prevention of elongation keeps the wheel in same position relative to work. This is pointed to as one of the features assuring accuracy. The wheel head is adjustable radially and for any angularity desired, including setting to angle for helix grinding, etc.

The machine may be used for either dry or wet grinding; a pump, tank and piping being part of the regular equipment. The maximum distance between centers of the No. 2 machine is 16 in., the grinding length 10 in., and the maximum diameter on centers is 8 in. The machine may be arranged for either belt or motor drive, two motors being employed for the latter. The floor space occupied is 3 ft. 4 in. by 3 ft. 10 in. The net weight is approximately 2400 lb.

### Automatic Band and Circular Saw Sharpener

A new ball-bearing automatic saw sharpener designed for the rapid and accurate sharpening of both band and circular saws has been brought out by the Hooker Mfg. Corporation, St. Johnsbury, Vt. The capacity of the machine is for  $\frac{3}{4}$  to 6-in. band saws with teeth spaced from  $\frac{5}{16}$  to  $2\frac{1}{2}$  in. and 8 to 36-in. circular saws having teeth spaced from  $\frac{1}{4}$  to  $2\frac{1}{2}$  in.

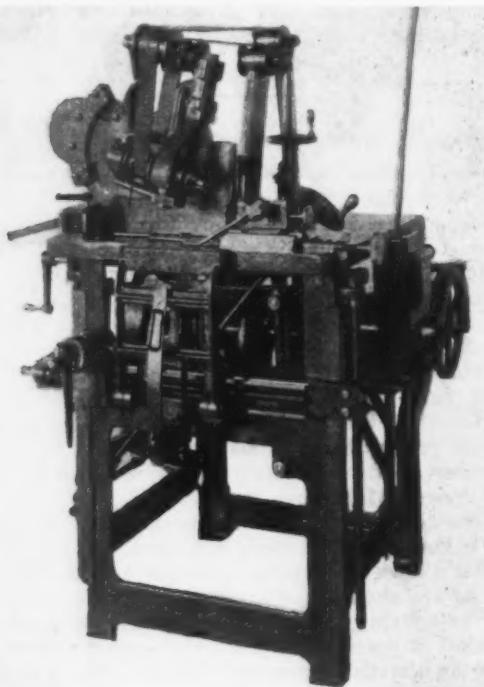
Convenient location of controls is among the features, and saws may be quickly placed on and taken from the machine. The emery wheel is arranged to oscillate to give any desired bevel to cut-off saws. All arbors are mounted in ball bearings and bearings are grease packed and tapped for Alemite connection. Change of cam is not required in sharpening cut-off and rip saws, and only one extra cam is used when sharpening band saws.

The frame of the machine is rigidly constructed and

the carriage that supports the arbor is accurately machined. A timer hand wheel is used to change the shape of the tooth of the saw as desired, and a feed finger screw is provided for changing the relation of the front of the tooth to the back face of the emery wheel. The screw does not, however, change the spacing. The spacer screw adjusts the saw feed to give the proper spacing for fine or coarse tooth saws.

The feed mechanism is accurately machined and is supported by a rigid frame. It operates to place each tooth for grinding at exactly the same point in its travel past the grinding wheel, regardless of variation in saw tension or pulling strain. This accurate operation is stressed as assuring uniformity in the size, shape and spacing of the teeth of the saw. The grinding head has large arbor bearings and broad sliding ways fitted to take up wear. The feed finger is of high speed steel and is knife-shaped. It is arranged to engage the face of a tooth at any desired point. The band saw rest is provided with a roller for carrying the saw, and may be adjusted for bringing the saw to the proper height. The arbor is driven by belt from the countershaft of the machine over self-adjusting idlers. The grinding wheel is adjusted to height by means of a hand wheel.

The machine may be arranged for either belt or



*The Machine Is Intended for Sharpening Both Circular and Band Saws. Operation is automatic*

motor drive, a  $\frac{1}{2}$ -hp. motor being required. The floor space occupied is 36 in. x 37 in. and the height of the machine is 54 in. The net weight of the motor driven unit is 750 lb.

### Purification of Open-Hearth Fuel Gas

Last June F. W. Sperr, Jr., director of research Koppers Co., Pittsburgh, read a paper at Youngstown before a meeting of the Eastern States Blast Furnace and Coke Oven Association on the subject of the "Purification of Open-Hearth Gas." That paper, with some additional material, has now been reprinted by the Koppers Co. Mr. Sperr listed the principal disadvantages of dry purification before launching into his advocacy of liquid purification. He places the efficiency of purification by the new process very high—up to 100 per cent in the cases of some of the substances in the gas. Removal of sulphur from the fuel gas for the open-hearth furnace is, of course, of great benefit, and this is one of the main accomplishments of the new process.

## New Universal Tooling Equipment

### New Line of Tools Developed for Use on Turret Lathes Permit of Making Multiple and Combined Cuts

A number of new tools for the Nos. 1, 2, 4 and 6 size turret lathes are being placed on the market by the Warner & Swasey Co., Cleveland. Four of these tools, a multiple turning head with overhead pilot attachment; a multiple cutter holder; an off-set cutter holder; and a cross slide cutter block are shown in the accompanying illustrations. They are carefully designed to provide rigidity and to make possible multiple and combined cuts. It is stated that the tools are made on the quantity basis, thus keeping the cost low and making it possible for the average shop to obtain well designed

ing head by four screws, which give a four-point bearing for alinement with a bushing on the head of the machine (patented). After proper alinement is secured, the bar is clamped firmly by means of a washer and nut on the rear end.

The overhead pilot bar passes into a bracket which attaches to the front of the head. The adjustable bushing (patented) makes it possible to attach the bracket to the machine when not in use. Only one bracket and bushing are required for each machine, as the pilot bar of each multiple turning head is adjusted to this one bushing. The multiple-turning head itself contains holes located at different distances from the center, giving a wide turning range. Various cutter holders of different styles are used for turning, boring, facing and chamfering.

Forged boring cutters may be held in the center hole by using the rocker bushing shown. The center

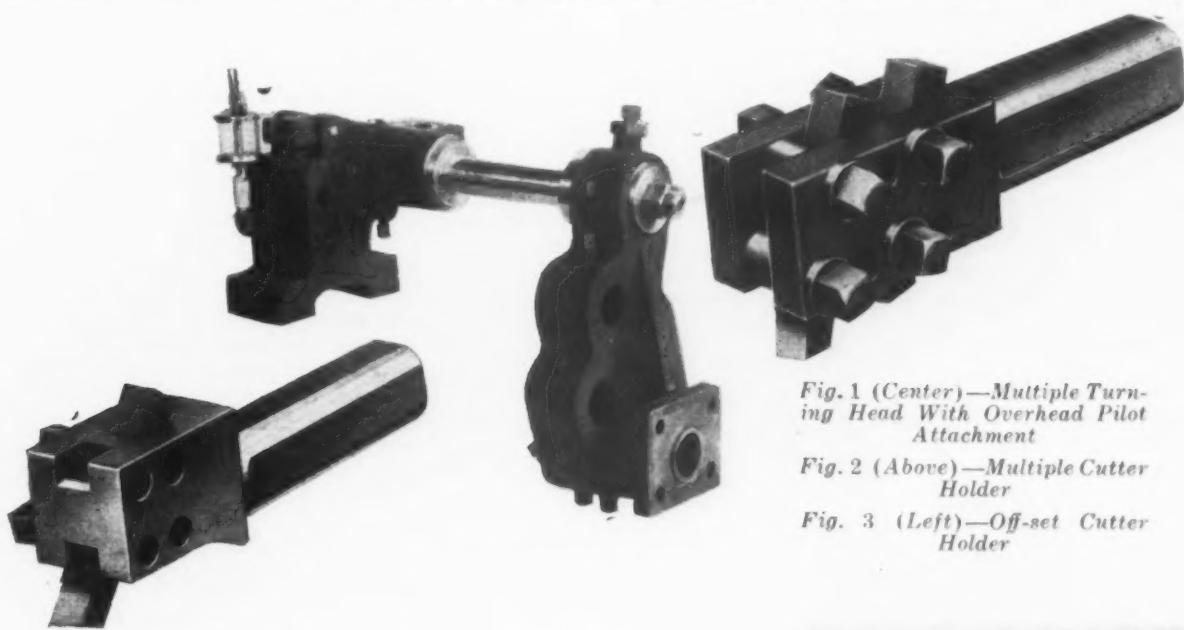


Fig. 1 (Center)—Multiple Turning Head With Overhead Pilot Attachment

Fig. 2 (Above)—Multiple Cutter Holder

Fig. 3 (Left)—Off-set Cutter Holder

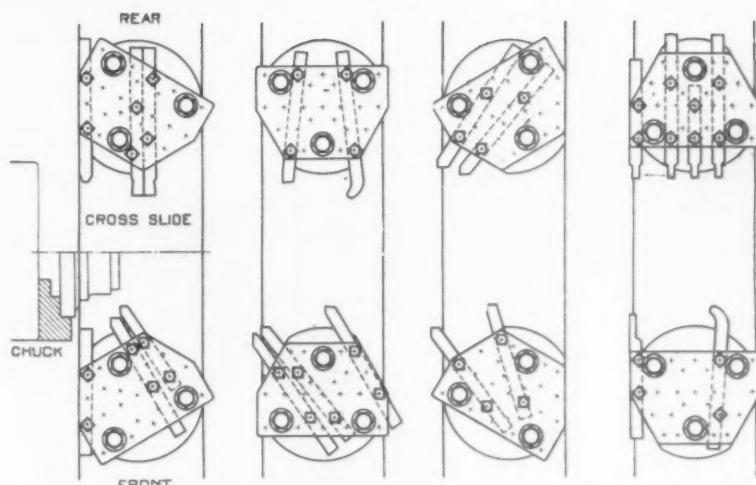


Fig. 5—Method Sketches Showing Four Positions of Front Cutter Block and of Rear Cutter Block. Inexpensive forged cutters or bits are used

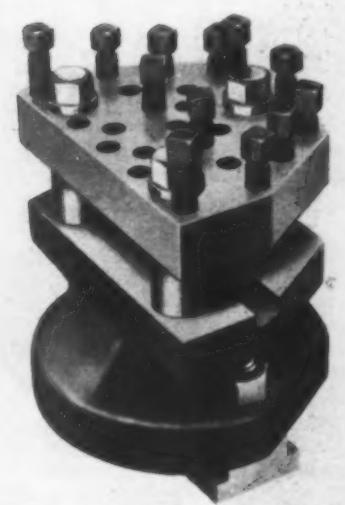


Fig. 4—Front Cross Slide Cutter Block for Multiple Facing and Forming Operations

tooling which will cover a wide variety of work at a low initial cost.

The multiple turning head with overhead pilot attachment, shown in Fig. 1, is particularly adapted for small and average lot work of medium or heavy type, since with this new tool heavy feeds can be taken without using special pilot bars. The distinctive feature of the overhead pilot bar is the radial adjustment which compensates for wear on the machine, without sacrificing rigidity. The bar is supported in the multiple turn-

hole may also be fitted with stub boring bars, drills, reamers, pilot bars and similar tools. The head itself is heavy and rigid, and is designed to afford suitable tool clearances. The tool may be set up quickly for multiple cuts. It will handle a wide variety of work, and diameters ranging up to the turning capacity of the machine may be turned.

The multiple cutter holder, shown in Fig. 2, is for use in the multiple turning head described above. The holder carries two cutters, which are adjustable to dif-

ferent positions for turning two diameters at the same time, or for turning and facing. Tie screws and bushings are provided to prevent the sides from springing apart when clamping the cutters. A variety of holes makes it possible to shift these to different positions for a wide number of combinations of tools. The holders may be moved in and out of the heads for the length of the cut. The entire holder is hardened and the shank is ground and flattened.

The off-set cutter holder, shown in Fig. 3, is also used in the multiple turning head when the cutter would project too far if used in the straight or angle cutter holders. Better support is given to the cutters, particularly when using stellite. Slots for the cutters are grooved from the solid, leaving tie pieces between the sides of the holder to prevent them from springing. The holder is moved in and out of the heads for the length of the cuts. The cutter is held by two screws. The entire holder is hardened and the shank is ground and flattened. Often when two diameters of different sizes must be turned and bored this tool is desirable to

reduce the overhang of the cutters by stepping down and stepping up with these holders.

In order to obtain multiple facing and forming operations on the cross slide, it has usually been necessary in the past to make special cutter blocks and cutters for each job tooled. While the increase in production, especially in quantity lots, soon paid for the extra expense of the special blocks, the universal cross slide cutter block shown in Fig. 4 has been designed to accomplish the purpose of the special blocks and at the same time may be used for a large variety of work. The blocks are available either for the front or rear, the front block being shown. The rear block is higher.

Each block may be set in four different positions on the cross slide, as shown in Fig. 5, and the cutters may be arranged in each of the four positions to give a variety of combinations. Inexpensive forged cutters or bits are used, so that when changing from job to job it is necessary to regrind and set the cutters only. The tool is made entirely of steel and is of heavy and rigid construction.

### Heavy-Duty Automatic Roll Feed for Punch Presses

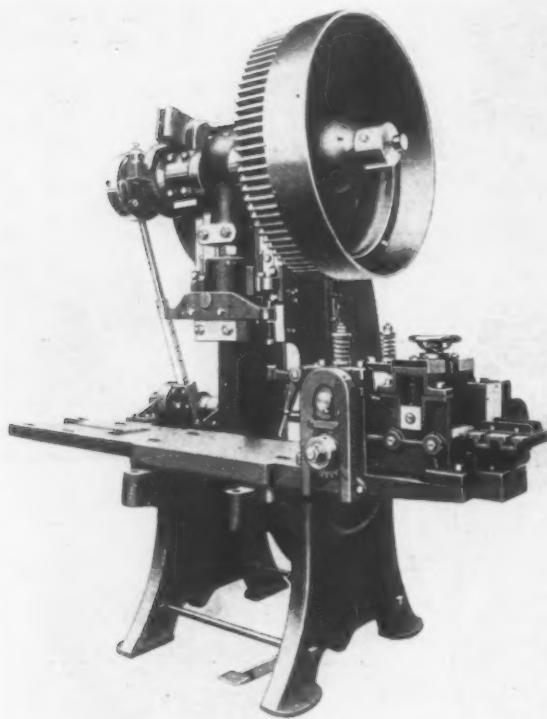
A heavy-duty automatic roll feed designed to feed cold or hot-rolled stock 0.137 in. thick by 4 in. wide, and also stock of No. 14 gage, 8 in. wide, has been brought out by the F. J. Littell Machine Co., 4127 Ravenswood Avenue, Chicago. The device, shown in the accompanying illustration, is particularly adapted for blank-

ranged to feed from 0 to 11 in. at each stroke of the press. It is stated that, although it was originally intended to feed  $\frac{1}{8}$  in. by 4 in. stock at 46 strokes per min., it was found in actual use that it was entirely satisfactory to run the press at 78 strokes per min., with an open belt and using a feed of approximately 6 in.

The roll feed shown in the illustration is mounted on a bolster plate which is arranged to accommodate a double-roll feed and also a scrap cutter, which are to be attached later. In the particular application of the roll feed here pictured, the stock is fed from right to left, and for this reason the single-roll feed is mounted on the right-hand side of press. Usually, however, a single roll feed is mounted on the left-hand side of the press and the stock is fed from left to right.

### Cutter and Tool Grinder with Self-Contained Motor Drive

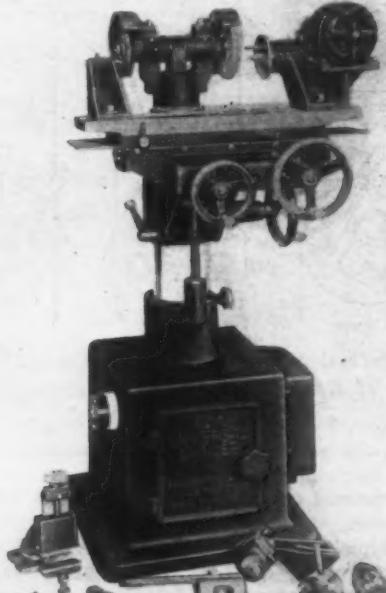
The No. 1 universal cutter and tool grinder of the Gallmeyer & Livingston Co., Grand Rapids, Mich., has been redesigned to provide for a self-contained motor drive, thereby eliminating the overhead works previously employed. All types of cutter, reamer and tool



*Punch Press Equipped With Automatic Roll Feed. The stock is fed from rolls into a straightener, then through the feed roll to the die*

ing hinges and heavy hardware, and is made to fit all makes of punch presses.

The stock to be punched comes in rolls weighing approximately 600 lb. It passes through a power-driven three-roll straightener, which takes out any curvature, and then goes through the feed roll to the die. The feeding rolls are  $6\frac{1}{4}$  in. in diameter,  $8\frac{1}{2}$  in. wide and are of tool steel, hardened and ground. The straightening rolls, which are also hardened and ground, are power driven and connected with gearing to the feeding rolls. All gears are of machine steel. This attachment is ar-



*The Motor Is Inclosed in the Base and Belted Through the Column to the Grinding Wheel Spindle. Overhead works are eliminated*

work which can be handled on standard universal cutter and reamer grinders can be handled on this machine, and the elimination of all overhead works is intended to bring it in line with modern demand for efficient and convenient motorization.

The machine employs a  $\frac{1}{2}$  hp. motor, which is mounted in the base and belted through the column to the grinding wheel spindle. A swing door at the front of the base makes the motor accessible for making bearing adjustments, cleaning the commutator, etc. A

1/12 hp. motor taking current from lamp socket is built into the headstock to provide for handling cylindrical and internal grinding. The work spindle is driven by means of a worm, providing the necessary slow speed and eliminating the necessary overhead drum.

Longitudinal, transverse, and vertical movements are controlled by conveniently placed hand wheels. The machine swings work  $9\frac{1}{2}$  in. in diameter and up to 20 in. wide. Longitudinal movement is 15 in.; transverse movement 7 in., and vertical movement  $6\frac{1}{4}$  in.

### Wire Cut to Length and Straightened Automatically

Unusually large production and accuracy of cutting are claimed for the automatic rotary straightening and cutting-off machine shown in the accompanying illustration. This machine, being placed on the market by the Hallden Machine Co., Thomaston, Conn., is designed to operate on round wire, which it takes from a coil and cuts into uniform lengths, depositing the straightened wire into a receiving tree. The flier is equipped with bell-shaped straightening dies so that the wire may be started without stopping the machine. The machines will be equipped with a seven-roll straightener and one pair of feed rolls to prevent slippage between the wire and the rolls.

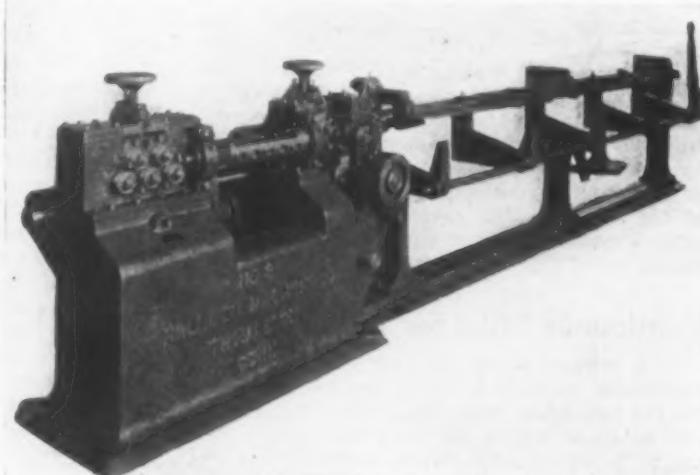
The shearing mechanism is of flying type. The shear is timed in with the feed rolls so that during the time of cutting off, the shear moves forward with the exact speed of the wire. This type of shear is claimed to prevent marking of the wire either by the feed rolls or by the rotary dies. A one-revolution-clutch of the roll-locking type is employed. This type of clutch will engage instantly upon tripping, thus assuring uniformity in the lengths of the rods. The clutch is of special tool steel, glass hard and is intended for severe service.

The tripping mechanism is of a trigger type. The wire passes under the trigger which causes the trigger to lift and release the stopping lever on the one-revolution clutch. The stopping lever is thrown out by a spring. The amount of pressure required to raise the trigger is small, thus preventing any bending action on the wire. The receiving tree is provided with tipping arms so that the rods may be dumped into a box or on a truck, dumping of the rods being accomplished by means of a lever. All fast running parts are mounted on roller

bearings equipped with the Alemite system of lubrication.

The seven-roll straightener, the flier, the front feed rolls and the shear are all operated from one shaft. The gear housings are entirely inclosed. The gears are of machine steel. The flier is driven directly from the main shaft, and the pinion on the flier is of fiber, the driving gear being of a special alloy. The machine is driven by a 10-hp. direct connected motor.

The machine is available in various sizes, the No. 2 unit being recommended for non-ferrous or steel wire



Wire Is Taken From a Coil and Cut Into Uniform Lengths, Then Straightened and Deposited Into the Receiving Tree. The capacity is for non-ferrous and steel wire from  $\frac{1}{4}$  to  $\frac{3}{8}$  in. inclusive

from  $\frac{1}{4}$  in. in diameter up to and including  $\frac{3}{8}$  in. in diameter. The weight of the No. 2 machine is approximately 6500 lb.

### Measuring Sales Efficiency\*

#### How One Sales Manager Checks Up on Orders Lost and Orders Received

AN analytical sales manager in our industry keeps certain records and charts that help him in his work and may also help others. First, the record traces every quotation made until the project is either abandoned by the prospect or is turned into an order. A record card does this. As long as the project is open, this card is in the "Projects Open" file. If abandoned it goes into a "Projects Abandoned" file. If lost to a competitor, it goes into "Orders Lost" and, of course, if taken by himself it is filed accordingly.

To get a definite measure of the efficiency of his selling, he takes the value of "Projects Open" at the beginning of each month and adds the value of new quotations made, which total measures the total chances of business he had for the month. This total is reduced

by the value of "Projects Abandoned" by the prospective buyers during the month, which are subtracted. The balance represents what both he and his competitors had to work on. To find what percentage of this he got, he divides the value of "Orders Taken" by this total. He also divides the value of "Orders Lost" by the same total to get the percentage that his competitors booked out of the possibilities. He charts these percentages from month to month.

If he is getting about the same share of business the percentage line runs approximately straight. But if the percentage of "Orders Lost" runs up and "Orders Taken" runs down, he sees that his competitors are gaining on him and it is up to him to get busy. If "Orders Taken" run up and "Orders Lost" run down he is happy, of course.

Such charts for each type of machine his company produces show which types are easier to sell compared to others by the proportions which "Orders Taken" and "Orders Lost" bear to the total "Projects Open." This has led to study of improvements needed in some lines, to definite abandonment of some others, and to more sales efforts on some others.

\*From a bulletin issued by Ernest F. DuBrul, general manager National Machine Tool Builders' Association.

## Ford Airplane Plant

### To Have Unusual Building of 60,000 Sq. Ft., Also Hangar Housing Fully 15 Planes

The Ford Motor Co., Detroit, will build at the Ford airport at Dearborn, Mich., a new airplane manufacturing plant and a hangar having a capacity for housing fifteen or more airplanes, forming what is claimed will be one of the largest and most modern airplane developments in the country.

The airplane plant will replace the building of the Stout all-metal airplane division of the company, recently destroyed by fire. It will have a floor space of 60,000 sq. ft., or three times as much as the old plant. It will be fitted with every modern facility for the manufacture of airplanes, laid out according to the standard Ford system of progressive production. Until the new plant is completed the airplane division will be located in one of the new buildings of the company's Dearborn laboratory group.

The airplane plant will be a one-story building 500 x 120 ft., of the same general type of construction as all the newer manufacturing and assembly plants of the company. The building will have a 120-ft. span without intervening roof supports, giving clear space for the assembly of airplanes.

The hangar building, construction of which has already started, will be 123x300 ft. An unusual feature of construction is that each of the 300-ft. sides will be enclosed by steel and glass doors that will slide back and fold into the ends of the building, permitting the entire opening of both sides. This will be accomplished by a roof construction of cantilever type extending on either side from steel towers built down the center of the building, the roof being supported much the same way as the cloth on the steel stays of an umbrella.

### Continuous Mills for Columbia Steel Co.

The inquiry is out for four 4-high 30-in. and 16-in. continuous mills and one 27-in. 2-high universal mill for the Columbia Steel Co., Butler, Pa., and an award will be made within the next few days. These mills are to be electrically driven and the electrical equipment also is to be placed shortly. Barton R. Shover, Oliver Building, Pittsburgh, is consulting engineer for the company, which is a combination of the Columbia Steel Co., Elyria, Ohio, and the Forged Steel Wheel Co., Butler, Pa., under the name of the former, as noted in THE IRON AGE of Jan. 14.

### "Acipco Mono-Cast Pipe"—A New Centrifugal Iron Product

The new plant being erected by the American Cast Iron Pipe Co., Birmingham, Ala., for the manufacture of centrifugal cast iron pipe in refractory molds, it now appears, will be ready for operation on a commercial basis by the middle of May. The plant will manufacture pipe in 16-ft. lengths and in diameters of 4 in., 6 in., 8 in., 10 in. and 12 in. The plant will be capable of operation 24 hours per day with a potential capacity equivalent to 2 to 6 in. 16 ft. pipe per minute.

"Acipco Mono-cast Pipe" is the trade name adopted by the company for this product. Mono-cast means a pipe made as a unit—an integral casting every part of which is formed at the same moment by centrifugal force.

This new centrifugal pipe will be bell and spigot with bead on the spigot end, and will be made under specifications providing for seven standard weights: Classes A, B, C, and D weights of the American Water Works Association, standard weights of the American Gas Association, and two lighter weights, which will be respectively approximately 17½ and 25 per cent lighter than standard class B American water works weights.

Exhaustive tests, says the company, show this new centrifugal pipe has the same reliable gray iron struc-

ture of the standard cast iron pipe that for many years has been made in the casting pits of modern pipe foundries. "Being cast centrifugally, however, it acquires certain characteristics that increase its serviceability to an extent not obtainable with pipe made in the usual way in vertical or horizontal molds."

The development of this process has been underway at the plant of the American Cast Iron Pipe Co. for the past three years. Since that time approximately 10,000 tons has been made and is now in service in all sections of the country. The company does not now expect that the product itself will be ready for distribution in commercial quantities before the latter part of May.

### Bookings of Commercial Steel Castings Above Production

January bookings of commercial steel castings as reported by the Department of Commerce amounted to 84,232 net tons. This was a slight drop from the December figure of 85,397 tons, but otherwise was much the largest total in more than a year. It compares with 82,922 tons in January, 1925, and with about 61,000 tons as the monthly average for 1925. The January figure represents 83.9 per cent of capacity, and the reports cover more than two-thirds of the commercial castings capacity of the United States.

Railroad specialties in January accounted for 37,677 tons, or 87.6 per cent of capacity. Except for December and the previous January this was much the largest figure in more than a year; it compares with 24,627 tons as the average month in 1925. The December figure was 43,215 tons, while January, 1925, showed 40,799 tons. Miscellaneous castings amounting to 46,555 tons were booked in January, representing 81.1 per cent of capacity. This is more than 10 per cent above the highest figure of 1925, December with 42,182 tons and January with 42,123 tons having been the largest. The average figure for 1925 was 36,352 tons.

Production in January was considerably below the tonnage booked. It amounted to 71,996 tons, or 71.7 per cent of capacity. This was made up of 29,565 tons of railroad specialties and 42,431 tons of miscellaneous castings.

### Financial Showing of Republic Co.

Full Benefit of Plant Improvements, Says Chairman Topping, Will Not Be Realized Until This Year

While further plant improvements will be made by the Republic Iron & Steel Co. during 1926, it is stated in the annual report to stockholders signed by Chairman John A. Topping that "all major improvements have been completed and manufacturing properties thoroughly modernized—full benefits from these improvements were not realized during the (past) year but should be reflected in future operations." The net profits for 1925 were about double those of 1924.

The following comparative statement of earnings and disposition shows the effect of narrowed profit margins:

	Year Ending Dec. 31, 1925	Year Ending Dec. 31, 1924	Year Ending Dec. 31, 1923
Gross profits .....	\$6,669,702.23	\$4,414,657.11	\$9,267,795.96
Depreciation and charges .....	2,856,218.02	2,496,720.81	3,015,577.66
Net profits .....	3,813,484.21	1,917,936.30	6,252,218.30
Dividends .....	1,750,000.00	2,000,000.00	3,250,000.00
Amount carried to surplus .....	640,616.48	*82,063.70	3,002,218.30
Balance surplus account .....	33,562,388.54	32,921,772.06	33,003,835.76

\*Deficit.

Despite the increased tonnage produced last year (1,107,000 tons of pig iron, finished and unfinished steel) as against the output of 1924 (847,000 tons all products) inventories were reduced by Dec. 31, 1925, from \$14,295,000 the previous year to \$12,901,000. This is accounted for, in the report, by lower costs of production and by greater concentration of operation with resultant reduction of stocks on hand.

# Possible Action to Curb Imports

## Customs Division and Tariff Commission Inquiries May Result in More Effective Protection for Blast Furnaces and Concrete Bar Makers

WASHINGTON, Feb. 23.—Considerable irresponsible publicity is appearing concerning the iron and steel situation both in the United States and abroad. A great deal of this class of material necessarily comes from Washington, growing out of discussions in Congress on the tariff and activities in executive branches of the Government which embrace inquiries as to iron and steel competition or other matters. At the same time, there have been published articles from other sources which ordinarily are reliable but in the present instance have been misleading.

It may be said at the outset that a great deal of the discussion about changing duties on iron and steel comes from Congress and may be considered wholly political. The administration does not have the remotest intention of tinkering with the tariff at the present session of Congress. Mr. Coolidge has made this plain and inasmuch as Congress is in control of the administration forces, it can be accepted as a certainty. Because of this alignment, published reports implying that tariff rates on iron and steel may be reduced may be discounted entirely with safety.

The iron and steel tariff situation as it is affected by Government activities at present is primarily in the hands of the Customs Division, Treasury Department, and the Tariff Commission. Any changes in tariff rates at this time would depend solely upon possible recommendations of the commission in connection with inquiries conducted under the flexible provisions of the Fordney-McCumber Act. Publicity speculating as to possible changes through this channel and arguing for or against necessity of changing the rates is only conjecture.

### Concrete Bar Inquiry by Tariff Commission

The work of the Customs Division actually is commanding much more immediate interest than that of the Tariff Commission. This is due to the fact that machinery of the Customs Division is more rapid in its execution than that of the Tariff Commission. This is not the fault of the commission, but rather is due to the law under which it operates. Interest in the Customs Division has been heightened by heavy importations of pig iron and relatively large importations of steel. As a result of these incoming shipments the Customs Division has inquiries under way with a view to ascertaining whether or not it should apply anti-dumping or the countervailing duties or both. The Tariff Commission itself has been giving consideration to a request of producers of reinforcing steel bars for an increase of the duty on that product through the flexible provisions, but so far as is known, the commission has not acted. Its principal work has been an extensive and long-drawn out inquiry based upon a complaint of Eastern merchant blast furnaces against imports of pig iron. It is understood that its report on this subject finally has been completed and may be made public in the near future. Upon the basis of this investigation the commission will determine whether or not to recommend that the President increase the rate.

### Alleged Dumping of Iron Probed by Customs Division

Eastern furnaces have protested particularly against large pig iron imports from British India. Another important angle of the import problem relates to the investigation by the Customs Division. The anti-dumping unit is understood to have virtually completed its inquiry, although the difficulties encountered in learning comparable prices of Indian iron both for the home market and for foreign shipments are understood to have been so great that there is doubt as to whether the probe will result in any concrete determination. The possible application of countervailing duties on iron imported from India is also being studied by the Customs Division because of the bounties paid by the

Indian government on the production of ingots. Here also there is a great deal of doubt as to whether the countervailing section can be applied on pig iron, which is given no bounty. The only possible application would be based on the contention that the payment of bounty on steel constitutes an indirect bounty on pig iron.

### Look Into Rebates on German Steel Exports

An inquiry under the countervailing section is also being made into rebates being paid to German manufacturers of steel when the product is meant for export. In this instance there seems to be a more tangible prospect of results. The anti-dumping unit is also investigating imports of iron and steel bars, structural shapes, etc., from Germany. This inquiry has been under way for some time, and interest in it has been heightened by the fact that it is understood that some structural shapes from Germany will be used in the construction of the new book stack section to be added to the Library of Congress, an adjunct of Congress, which is used by members of the House of Representatives and the Senate when seeking intellectual food, some of which may concern the tariff itself.

The contract for the construction of this unit of the library has been awarded to the Snead & Co. Iron Works, Jersey City, N. J. It is understood that this addition to the library will require from 700 to 800 tons of steel and that the great bulk of it will come from domestic mills.

In connection with publicity concerning the iron and steel situation much of it has dealt with foreign competition. Some writers who have attempted to belittle incoming shipments have compared the latter with the production or capacity of American furnaces and mills. Manifestly the imports are relatively light when so measured.

### Serious Effects of Pig Iron Imports

This kind of comparison, however, is held by those protesting against imports to be superficial and illogical. The point has been made that the imports do seriously affect certain sections of the industry. The outstanding examples are the imports of pig iron. The incoming shipments of pig iron for the calendar year, 1925, totaled 441,425 gross tons. When measured against the total blast furnace capacity of the United States this figure looks small, being somewhat less than 10 per cent of the capacity of the United States. Actually those protesting against these imports say the comparison not only should be reduced to merchant furnaces along the Eastern seaboard but should be even more restricted by limiting it almost wholly to foundry iron. Upon this basis, it is pointed out, the competition becomes formidable and to it has been attributed reduced operations of furnaces in the East. Likewise, this is given as one reason for the serious situation affecting Virginia furnaces, which also have been hard hit, it is alleged, by high freight rates.

## Committee for Mechanical Engineers' Meeting at Providence

Announcement is made that the executive committee in charge of the meeting to be held by the American Society of Mechanical Engineers at Providence, R. I., May 3-6, is as follows: Luther D. Burlingame, chairman; Norman L. Sammis, secretary; John R. Freeman, James A. Hall, Frederick C. Freeman, Eugene W. O'Brien, Warren B. Lewis, Charles G. Richardson, Samuel D. Fitzsimmons, William A. Kennedy, William H. Kenerson, Mrs. Henry D. Sharpe, Albert E. Thornley, Charles A. Horton, Richard B. Watrous, Frederick N. Connet, Arthur N. Sheldon and Francis A. Chiffelle.

# Business Analysis and Forecast

BY DR. LEWIS H. HANEY

DIRECTOR, NEW YORK UNIVERSITY BUREAU OF BUSINESS RESEARCH

Favorable and Unfavorable Factors Affecting Business  
May Be Summarized as Follows:

## Favorable

1. Absence of serious maladjustments.
2. Decrease in stocks of manufactured commodities in first hands.
3. Prompt readjustment of industrial output and bank credit.
4. Record-breaking bank debits.
5. Upward trend of labor earnings.
6. Continued large building activity.
7. Settlement of anthracite coal strike.
8. Favorable tax legislation.

## Unfavorable

1. The P-V Line declines.
2. Unfilled steel orders decrease.
3. Smaller volume of new enterprises.
4. Irregularly lower commodity prices.
5. January retail trade declines.
6. Railroad labor demands.

At present the unfavorable factors are strong enough to indicate a minor recession in business. Business, however, is very active, the industrial output is large, and prices are relatively stable. The prospect is for irregularity for a few months, but for no major recession. It is quite possible that the readjustment may be effected with little disturbance.

THE upward trend in the business cycle continued through December. The cycle index prepared by the New York University Bureau of Business Research was 108.2 in December against 105.8 in November and 107.5 in October. This indicates that the general level of business was up to that of March, 1923, but had not attained so high a point as was reached at the peak of the last cycle.

Our relative position in the cycle is indicated by the following comparison. The cycle index stood at 111.5 at its peak in May, 1923. It fell to 93.3 at the bottom in June, 1924. Since then it has recovered to 108.2.

This situation suggests several questions: Are we at the peak of the cycle? Was the 1921-24 movement a true cycle? Is the character of business cycles changing? Taking these questions up in order our thought is as follows.

There has been no boom such as characterized the winter of 1922-23. Commodity price inflation and speculative pyramiding have been notably absent.

Overproduction has not appeared to any important extent. Therefore, while business easily gets out of adjustment when it expands, there is no reason why it should contract to any great extent. Some further downward readjustment is indicated for the near future, but no major cyclical downswing seems called for.

The upswing and downswing which characterized the period between 1921 and the middle of 1924 appears to have been a true business cycle, but the downswing in 1924 was not of major depression proportions. It left no great gap to be filled up and accordingly the upswing which has occurred since then has been relatively moderate.

This suggests that possibly the nature of the present business cycle is different from those that have generally occurred in the past. As has been suggested before in this department, it seems that the tendency is for business to become more stable and for business ups and downs to be less violent and prolonged. Recent industrial history seems to justify the hypothesis

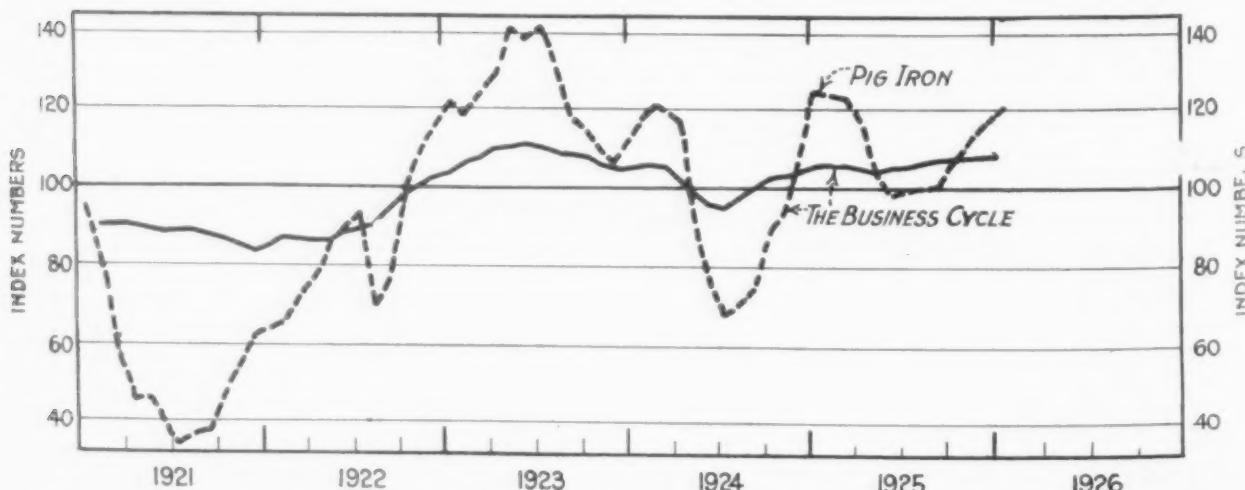


Fig. 1—As Has Usually Been the Case, Pig Iron Fluctuations Are Considerably Sharper Than Swings in the Business Cycle

# In This Issue

*No likelihood of any immediate reduction in iron or steel import duties.*—Some possibility of action in regard to pig iron tariff increase on Eastern seaboard; talk of reductions merely political.—Page 571.

*Business readjustment may be effected without much disturbance.*—Overproduction being reduced, building very active, consumption still high, coal strike settled; some recession may take place, but it will be of minor importance.—Page 572.

*Should machine tools be sold on the installment plan?*—Makers agree that such a system might prove useful, but suggest careful safeguarding of such accounts by interest rate above current rate.—Page 602.

*Pressed Steel Car Co. loses \$2,000,000 damage suit.*—Court contends Carnegie Steel Co. had right to divert shipments where necessary in war time.—Page 602.

*24,000,000 families in U. S. A. today, but also 15,000,000 stockholders.*—Trend toward wider distribution of securities and employee ownership of companies constitute a real industrial revolution.—Page 542.

*New International Trade Exposition opened at New Orleans.*—Industries requested to send samples of products with complete information.—Page 561.

*Better for control of industry to be in hands of workers than of financiers?*—Employees now virtually control Philadelphia Rapid Transit Co.; plan has operated to satisfaction of men and management.—Page 545.

*Large units in steel industry are no barrier to individual opportunity.*—Better market to seller offered by large corporations as compared with small, struggling concerns; also, better material possible for buyer.—Page 578.

*Use of ultra-violet light in microscopical study of metals offers great possibilities.*—May pave way for new heat-treating developments; much sharper resolution than with ordinary light.—Pages 555, 579.

*Embrittlement of malleable castings prevented by heating to a temperature of 600 to 750 deg. C. and quenching.*—Castings may then be galvanized by hot-dip process with no fear of brittleness.—Page 558.

*Recent researches on iron-tungsten and iron-chromium alloys mark beginning of new art, says Zay Jeffries.*—Will include hardening of carbonless iron alloys and heat treatment of alloys in which gamma iron plays no part.—Page 550.

*Quarter billion in wages lost annually because of sickness.*—Average annual expenditure of industrial plants for medical service to employees (500 plants) amounted to \$3.62 for each \$1,000 in wages.—Page 560.

*Sales manager uses ratio between orders taken and business tried for to measure sales efficiency.*—Any deviation from an average ratio is reason for close check-up on sales organization.—Page 569.

*No general scientific agreement exists as to what causes hardness of steel.*—No uniformity shown in replies to questionnaire sent by Dr. Sauveur to 23 prominent metallurgists; some few points now generally accepted.—Page 549.

*January business in a nutshell.*—271,231 passenger cars, 29,601 trucks produced, large gain over last year but lowest month since September; steel casting bookings above production, 84,232 tons ordered, 83.9 capacity; fewer new enterprises; retail trade lower than December; record-breaking bank debits; commodity prices irregularly lower.—Pages 560, 570, 572.

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## Democracy in Corporation Ownership

IN this issue of *THE IRON AGE* two of America's business leaders express their favorable opinion of the trend toward employee ownership of corporation securities. While radicals and reformers have urged unsound panaceas and advocated industrial revolution, there has been another type of revolution going on quietly all the time. What this change in business ownership means and how it will affect current business policies is a matter of concern to every executive. *THE IRON AGE* is glad to be able to present the views of George E. Roberts and George M. Verity on this important subject.

*For News Summary See Reverse Side*

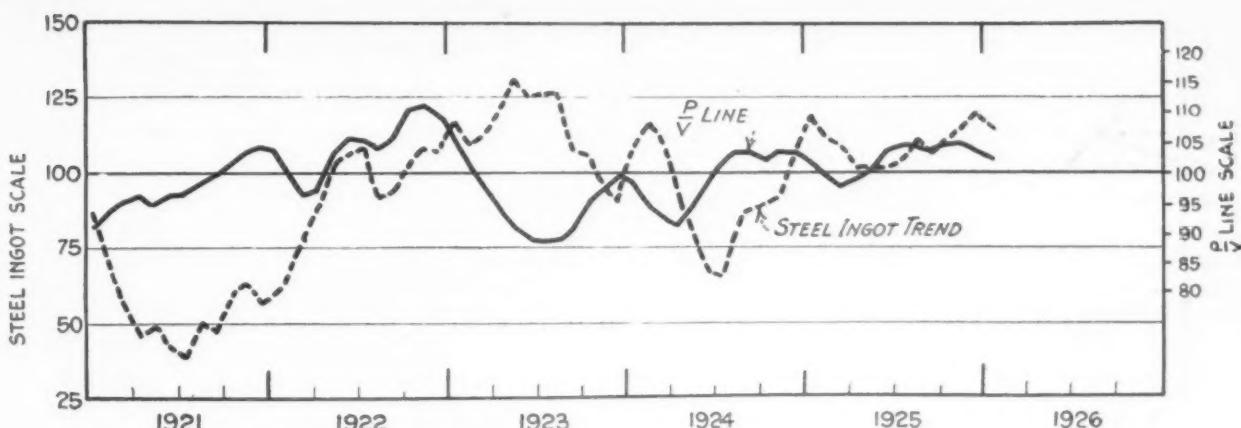


Fig. 2—The Trend of Steel Ingot Production Has Very Closely Followed the Movements of the P-V Line

that wiser and more effective financial control and increased statistical information and study of business trends are making industrial readjustments more speedy and effective than used to be the case.

As usual, pig iron production has run ahead of the general trend of business on the upswing (See Fig. 1). The output of pig iron, however, is not so far out of line with the cycle curve as it was a year ago and is much less so than in 1923. While it is true that the January rate of production was too large to be long maintained, it may well be observed that there has been no such prolonged excess as in 1923 and that no such recession as occurred in 1924 is probable. Rather we may expect a minor readjustment which will be more like that of 1925.

#### Business Now Nearly Normal

THE P-V Line continued its moderate downward course in January (See Fig. 2.). It is evident that on the average the demand for commodities is not sufficiently strong to absorb the supply at present prices. It follows that we must expect either decreased production or lower prices—or possibly a little of both. The close observer, however, will note that the decline in the P-V Line has been very moderate indeed and that it stands at a point somewhat above its location of a year ago. This is one reason why only a moderate readjustment is indicated for the near future.

In fact, leaving the matter of trend or direction of movement out of consideration, it is noteworthy that *business today is very nearly normal in most respects*.

As usual during the last two years, the output of steel ingots (allowing for seasonal variation) continues to follow the P-V Line by two or three months. After eliminating the merely seasonal gain, the ingot output shows a decline in trend in January, indicating a prompt readjustment in the steel business to conform with the business outlook. It now appears that a further moderate recession in steel activity is called

for and will occur—perhaps much after the fashion of the 1925 readjustment.

#### Moderate Steel Recession Probable

THE obvious fact shown in Fig. 3 is that the trend of scrap prices and of unfilled steel orders is now downward. This is significant both as to the trend of business in general and of the iron and steel industry. Both of the items mentioned are "barometric." The indicated tendencies for the near future are moderately lower prices and decreased production. The only questions are—How much? How long?

The answer to these questions depends on the adjustment in production. In 1923, for example, the production of iron and steel ran far beyond the signals set against it by such barometers as the P-V Line, unfilled orders, and even the trend of scrap prices. A rather severe recession resulted. Now, however, *steel production is following the rise and fall of the barometers quite closely and accordingly any recession should be moderate*.

It may be noted, too, that the unfilled orders barometer has nearly run its normal course in the way of a complete cycle and a glance at Fig. 3 will suggest that its downward trend will probably be terminated in another month or two. This, again, suggests that inasmuch as steel prices are now so low, any further decline will be very moderate and not last long.

#### Building Activity Still Large

THE chart of building activity is shown again this month because of the special interest in this industry. Uncertainty concerning the trend of building activity is one of the chief deterrents to business progress at the present time.

Our adjusted index of the floor space in building contracts awarded (Fig. 4) increased in January and reached the highest point on record for that month. Several considerations, however, give a less favorable impression than this bare statement. It will be noted

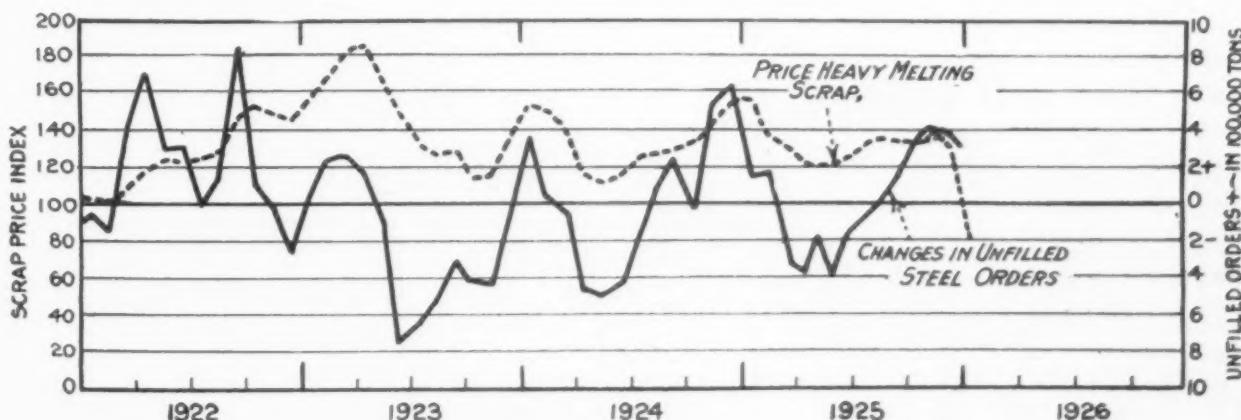


Fig. 3—Scrap and Unfilled Orders, Both Barometric, Point Clearly to a Downward Trend in Steel Production

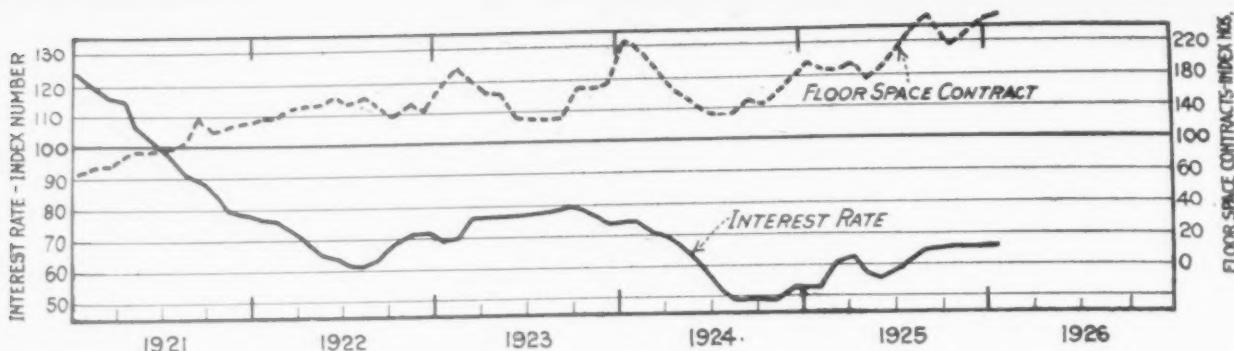


Fig. 4—Despite the Lower Rent Level and Money Rates Higher Than a Year Ago, Building Volume in January Broke All Records for That Month

that the increase was the smallest for January which has occurred since 1922; also that this is the first time since 1922 that the January figure has not exceeded that of the preceding September peak. There has been a continuous decline in residential rents for over a year and the rent index of the National Industrial Conference Board in December was the lowest since October, 1923.

On the other hand, the interest rate, which is an important factor in controlling speculative building, is considerably above its level of a year ago. In January the rate on prime 60-90-day commercial paper failed to show the usual seasonal ease and consequently our adjusted index was higher. Time loan rates eased a little, but only about the usual seasonal variation.

The cost of money is not likely to increase further in the near future, for commodity prices are moving a little lower, the Federal Reserve ratio has recovered, and commercial needs for money are easing with a slackening in business. But, with lower rents and somewhat higher money rates and with the shortage in buildings largely removed, the upward trend of building activity will probably be checked within a month or two.

It is probable, however, that building activity will hold up for several months and not show any sharp slump when the period of expansion does end. Contemplated construction and building permits increased considerably in January which should insure a large building program for some time to come.

*The schedule of the next installments of Doctor Haney's analyses follows: March 11—Status of steel consumer demand; March 18—Position of iron and steel producers; March 25—General business outlook*

### Inter-University Metallurgical Conference

An important gathering of metallurgical students, representatives of the whole body of university trained metallurgists in the United Kingdom took place in the Edgbaston buildings of the Birmingham University on Feb. 19 and 20. Representatives of local and other plants were present.

The object of the conference this year was the promotion of a fuller understanding and a greater degree of mutual sympathy and cooperation between works and university departments. For this purpose the subject for discussion was "The Position of the Metallurgical Student in Industry." The findings of the conference will be communicated, as fully as possible to the technical press. Delegates paid a visit to the British Industries Fair and were the guests, at a dinner, of the Birmingham University Metallurgical Society on Friday, Feb. 19. Further information can be obtained on application to the secretary of the Metallurgical Society, University of Birmingham.

### New Foundry Plant at Youngstown Made Fireproof

The Youngstown Foundry & Machine Co., Youngstown, has placed in operation a new foundry, replacing its plant on Poland Avenue, which was destroyed by fire. The main foundry building is 115x260 ft., with two inside craneways the full length and provision for an outside craneway. On one side are the material bins, core ovens, cupolas and electric elevator to hoist materials to the steel charging floor. This building contains the pattern receiving room, wood-working shop, generator and electrical rooms. The cleaning building is 50x100 ft., with craneway its full length and railroad track extending through it into the main foundry building. The pattern storage building is a standard steel building of the Truscon type, 40x120 ft.

Construction of the buildings is all fireproof, con-

sisting of heavy structural steel framework supported on concrete foundations, with reinforced concrete roof. Walls inclosing the buildings are brick to the height of the window sills, the remainder being steel sash glazed with ribbed wire glass to afford maximum natural light. Though the temperature was at times 15 deg. below zero, the roof, consisting of 36,000 sq. ft. of concrete, 2½ in. thick, was successfully laid in five days. The new foundry will provide employment for 150 men, including molders, core-makers, electrical workers, chippers and unskilled labor. The company, which operates three plants in Youngstown, specializes in the manufacture of rolling mill machinery and sand and chilled rolls. Among recent orders is one for 500 tons of castings for the new blast furnace to be built by the W. B. Pollock Co., Youngstown, at Weirton, W. Va., for the Weirton Steel Co. W. J. Wallis, president, has had more than 25 years experience in foundry work.

### Steel Barrel Output in January

January production of steel barrels, based on Department of Commerce reports from 31 establishments, amounted to 468,722. This was a minor increase over the December figure of 467,485, but was considerably higher than that for January, 1925, at 420,127. January production was 6.9 per cent below the average month of 1925, which showed 503,221. It was, however, 19 per cent above the average month of 1924, in which production was 393,800.

As for some months, shipments were almost identical with production. Unfilled orders showed a slight increase at 1,765,846, against 1,745,346 at the end of December. This increase was wholly in orders for early delivery, which amounted to 431,772 within 30 days, against 368,286 a month before.

Percentage of capacity used in January, as reported by the Steel Barrel Manufacturers Institute, Bulkley Building, Cleveland, was 43.8, this representing the membership of the institute. The volume of business of the members during the month was \$1,158,674.

# Opposes Aluminum Company Probe

Minority of Senate Committee Reports Justice Department Finds Evidence Does Not Support Charges Made

WASHINGTON, Feb. 23.—Despite efforts of some members of the Senate Committee on Judiciary, who in a majority report prepared by Senator Walsh, Democrat, of Montana, urged that the committee investigate the Aluminum Co. of America, the Department of Justice has held that successful prosecution of contempt proceedings against the company cannot be maintained. The position of the department was made known by Senator Cummins, Republican, of Iowa, who filed a minority report in opposition to the majority report of the Senate committee.

Pressure for investigation of the Aluminum company by the committee was brought by Senator Walsh and other members on the grounds that the Department of Justice had been negligent in proceeding against the Aluminum company. It also has come at a time when the Federal Trade Commission is conducting an inquiry at Pittsburgh. There are many who have construed the apparent attempt at a concentrated drive upon the Aluminum company as a mere political play. At the same time, it is interesting to observe that some prominent Democrats in the Senate are strongly opposed to what they call a mania for investigations. The cost to the Senate for investigations already made has been so high as to shock some of the members who have just been acquainted with the figures by Senator Overman, Democrat, of North Carolina. The drain on the contingent fund has been so heavy as to almost deplete it, and if investigations desired by some of the more ambitious members were carried out, a deficit would ensue.

Moreover, some members of the Senate, including Mr. Cummins, have pointed out that for Senate committees to take up investigations which are the province of administrative branches of the Government is an encroachment upon the rights of the executive branch.

The conclusions of the Department of Justice in the Aluminum case were made following an investigation based on charges filed with it by the Federal Trade

Commission. One charge alleged delaying of shipments, another the furnishing of defective metal, a third discrimination in prices on crude or semi-finished aluminum, and a fourth hindering competitors from enlarging business operations.

It was held by the Department of Justice that there was no evidence to support the charge that the company had intentionally delayed its shipments, and it added that there was no specific complaint alleging injury.

## Defective Metal

Concerning the charge that defective metal had been furnished, the department said it believed the evidence clearly showed that the company made earnest endeavors to maintain the quality of its product and, when unable to do so, accepted the return of defective metal and made proper adjustment. The department also reported that "there are firm grounds for the conclusion that instances of price variations were amply justified by conditions applicable to each."

Dealing with the charge that competition had been hindered, the report held to be wholly unwarranted the belief of the Federal Trade Commission that "the original decree is obviously insufficient to restore competitive conditions in harmony with the anti-trust laws, especially with respect to the monopolization of bauxite lands."

The opinion added further:

The charge of violation of a decree is criminal in its nature and requires proof of guilt beyond a reasonable doubt before a conviction can be had. The facts developed in this investigation show that it was a wise precaution on the part of the department to make a further investigation of the charges alleged by the commission to exist. It now appears that had the department filed a citation for contempt when the report was received, it would have been wholly impossible to sustain the charges appearing therein.

## Aluminum Company Contracts and Letters Entered in Trade Commission Hearings

PITTSBURGH, Feb. 22.—Hearings in the investigation of the Aluminum Co. of America by the Federal Trade Commission, begun at the Federal building here, Feb. 15, were adjourned last Friday until May 3 or 13, depending upon when the company could make ready for further procedure. The commission, as represented by Richard P. Whitely, counsel, is leaving no stone unturned in its effort to prove that the company is a monopoly. It has requested a copy of the list of stockholders holding more than 3 per cent of the company's stock in an effort to prove that the small stockholders may include some who might be able to assist the company in restricting the activities of smaller companies. George R. Gibbons, vice-president and secretary of the company, who was on the stand continuously from Monday until Friday, except Thursday, when the annual meeting of the company forced a recess, has been identifying by title 740 letters and contracts subpoenaed as part of the record in the case. During the recess Mr. Whitely, accompanied by associate counsel and an accountant, spent the day at the company's offices looking over the subpoenaed letters and contracts which Mr. Gibbons had not reached in his readings.

The charges against the company have grown since the opening of the hearings and the effort of the

commission now is to establish that the company not only controls the aluminum ingot and finished aluminum market, but also the aluminum scrap market. The hearing adjourned after 448 letters and telegrams and photostat copies of 54 extracts from contracts had been made part of the record, because the other letters and contracts had become scattered and could not be immediately presented.

There was doubt that the company would provide a list of the 3 per cent stockholders. Certainly, W. W. Smith, counsel for the company, has not withdrawn objection entered at the time of the original request on the first day of the hearing. Mr. Whitely announced that if, after consideration, the list was deemed of sufficient importance, the necessary steps to obtain it would be taken.

## Hyman-Michaels Co. Buys Copper Smelter

The Hyman-Michaels Co., Chicago, has purchased the Mammoth, Keystone and Kennett properties at Kennett, Cal., of the United States Smelting, Refining & Mining Co., Boston. In addition to the plants, which constitute one of the largest copper smelting properties in the world, the purchase includes trackage and railroad equipment.

The Hyman-Michaels Co. will probably operate a part of the plant for a time, but is considering offers from other large smelting and refining companies for the purchase of the works in full or in part.

ESTABLISHED 1855

# THE IRON AGE

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## Big and Little Business

STEEL-MAKING is only one of many illustrations of "big business" being in furtherance, not in restraint, of trade. The way is open for outside capital to embark in steel making, if it chooses. It does not so choose, and the reason is that the prices at which steel has been selling, and is likely to sell in future, do not offer inducement. It is not a case of big business having tied up the opportunities. That is the test. Big business is good or bad according to whether it establishes itself by service to the public or by erecting artificial barriers. One is furtherance of trade, the other restriction.

In the old days of antagonism to "big business," the argument was used that there ought to be "opportunity" for men to go into business and "big business" curtailed the opportunity. The principle claimed was right, but the application was wrong. There is greater opportunity than ever before for men to go into business.

Again, the steel industry may be used as an excellent illustration. In this connection reference to the advertising pages of THE IRON AGE will not be considered in bad form. There are many advertisers who have things they offer for sale to the steel-making industry. Some of the concerns are large, some are small. They have a much better market for their wares than they would have if steel making were distributed among a great many small and struggling concerns.

Next, there are many advertisers who offer wares they make from the products of the steel-making industry. Their general testimony would be that they get better service, in deliveries and in suitability of material, from the steel industry as it is now constituted than they would be at all likely to get if steel making were widely subdivided among small concerns, no individual producer having the resources now at command for research work or the flexibility now shown in making deliveries as and when desired.

For continued prosperity a progressive country like the United States requires new things. The old things become more and more easily made,

engaging less labor and taking lesser proportions of the total income. The people become able to buy additional things, and additional employment is needed, making new things. The steel industry, grown big and efficient, on the one hand furnishes a good market for new things and on the other hand furnishes a good supply of material for the making of new things.

Instead of the steel industry having decreased "opportunity" in the past quarter century, it has greatly enlarged opportunity in these two entirely separate directions. It has been a great help in the economic progress of the country.

## Coke for the Public

IN the recent anthracite suspension the public showed its ability and willingness to take up substitutes, as remarked in this department of THE IRON AGE last week, and some of these substitutes will be permanently retained. Early in the suspension THE IRON AGE (Sept. 17, 1925) pointed out that much coke, particularly by-product, was sold for domestic and ordinary industrial use in an ordinary year, 1924. It is well to note now how much more coke can be conveniently and profitably supplied for public use. The annual coke statistics will not disclose precisely what was done during the anthracite suspension, as that fell into two calendar years, but the possibilities may be appraised.

It has been well recognized for several years that the beehive ovens of the iron and steel industry survive chiefly to take the peak of the load in blast furnace requirements, the steadier supply coming from by-product ovens. Much more is that the case with beehive coke for domestic consumption, which has rendered good service in the anthracite suspension. Consideration for the future is naturally of the by-product industry.

By-product coke production was lighter in 1924 than in the preceding or following year, but there was produced 33,983,568 net tons, the sales being 33,872,767 net tons. Of this the producers sold to themselves or to affiliated corporations 77.8 per

cent. Then there were sales of merchant furnace coke and of foundry coke, while 8.3 per cent was sold for domestic use and 4.6 per cent for general industrial use. Besides the coke referred to as regular product, there was in addition 2,950,810 tons of screenings and breeze produced, of which 536,037 tons was sold.

By-product coking capacity is rated at about 50,000,000 net tons a year. As production last year was approximately 40,000,000 net tons, it may be assumed that the plants would be capable of producing nearly if not quite their rating if given full employment.

It is evidently the definite intention of some of the producers who established their plants for the purpose of serving their blast furnaces, henceforth to cultivate domestic and general industrial coke trade. The coke sold in 1924 for domestic and general industrial use was made chiefly at works established for that purpose. If the iron and steel industry were to engage its coking capacity fully throughout the year it would, in the average year, have a considerable tonnage of coke to dispose of. For their own good the by-product plants need to be operated continuously, whereas blast furnace requirements vary widely. Even in a typically "good" year there are periods when blast furnaces run well below their maximum.

The coke can be stocked, and in the carrying of stocks of pig iron there is leeway. One may conceive of a steel company accumulating both coke and pig iron in a period of light demand for steel, and having correspondingly more coke to sell when there is demand for domestic fuel.

With the present by-product coking capacity, a rough guess would be that, with fairly steady operation, there would be in an ordinary year fully 10,000,000 tons of straight coke to sell to the public. In addition, there would be about 4,000,000 tons of screenings and breeze. Such tonnages are far from insignificant when set against the "normal" anthracite production of 90,000,000 tons a year.

### Violet Rays and Metal Structures

RESULTS of considerable importance are expected from the use of the violet ray in photomicrography. Announcement was made last week at the convention of the mining and metallurgical engineers of its applicability to the study of metal structures. An abstract of the first presentation of this subject appears elsewhere in this issue. The use of this character of light has already solved several problems in physiology. It is not improbable that its use may in a similar manner give help in metallurgical questions.

Only a beginning, it is safe to say, has been made. The power of great resolution possessed by the violet ray, exceeding anything now obtainable, even by high-power photomicrography, may serve to settle some disputed points, such as the constitution of martensite or the beta iron controversy. It may have practical value in that, by giving to the metallurgist a more intimate insight into what happens when elements and their com-

binations become active at various temperatures, some modifications in present heat treatment processes may be made and thus develop new properties or improve those now familiar. The announcement last week, while only a progress report, is believed to mean much in the advancement of physical metallurgy.

### New Trade Commission Act

UNDESIRABLE publicity given complaints brought by competitors against reputable firms and individuals, where later it was proved that no basis of complaint existed, is in part responsible for the Wadsworth-Williams bill now before Congress to check certain procedure of the Federal Trade Commission. In the agitation for the bill it is brought out that of the 10,255 investigations of charges of unfair practices instituted prior to June 30, 1925, with only 894 cases pending, 708 orders to cease and desist in unfair practices have been issued by the Federal Trade Commission. The percentage of well-based, just complaint is a small one.

Under the terms of the bill the commission would be required first to proceed informally against individuals or firms suspected of using unfair practices, unless it believed formal proceedings were justified in the first place. The commission could not make public the name of a respondent until it had been fully demonstrated that he had been guilty of unfair methods. No noxious publicity would be permitted until it had been proved to be merited.

Informal proceedings are likely to invite confidence rather than antagonism and to lead toward the abolishment of questioned practices without involving the cost and loss of time resulting from formal action. The bill further provides that the commission be required to state its reasons for believing that a questioned method is unlawful and the respondent is permitted to move the dismissal of the proceeding on the ground that the notice fails to show *prima facie* cause of action, and if the commission denies the motion the respondent may take the matter to court for review.

The purpose of the bill, it is our understanding, is to give legal sanction to changes in practice already made by the commission. In the past the commission has been comparatively free to follow whatever procedure it deemed wise, with the result that its policies have changed on occasion with its personnel. The measure would assure the permanence of the revised procedure.

FIRE recently swept through a part of the thirty-fifth floor of the famous Equitable Building in New York. It furnishes a lesson to the metal trades. The fire did not spread because it could not spread. But the gutted interior of the offices asks a question that should not be unanswerable: Why endanger life and property by using wooden furniture and partitions when steel will do as well? Why risk the destruction of thousands of dollars' worth of valuable records . . . a loss for which insurance can never adequately compensate . . . by using furniture and

equipment which will burn? Steel filing cases and safes saved many valuable records in the offices as it was, but there need have been little damage.

### Dividends from Better Efficiency

INDICATING the financial difficulties encountered by steel companies within the last three years is the decline in the average shipment price of finished steel products of the Sharon Steel Hoop Co. The average shipment price declined to \$62.60 per ton in 1925, from \$80.90 a ton in 1923. The figures are illuminating in that there has been no material change in the nature of the company's products during the period mentioned. The Sharon company's experience for the past three years shows the following exhibit:

	Gross Billing	Gross Shipments	Average
1925.....	\$20,005,625	319,207 tons	\$62.60
1924.....	18,452,028	274,112 tons	67.30
1923.....	22,810,331	282,015 tons	80.90

This instance is more or less typical of what has been happening to other steel companies. The fact that the industry has been able to meet price declines of such proportions and still show profits, however meager, indicates the extent of

improved efficiency through installation of more modern equipment, labor-saving devices and the like. The complete story of what the industry has accomplished in this respect remains to be told.

### Cutting Losses by Heat Treatment

Eliminating 20 to 40 per cent losses in the production of certain types of malleable castings is obtained by the discovery of a simple heat treatment. The experience of an Ohio foundry, as described on other pages, is a striking example of the value to an industry of simple heat treatment principles. For years the losses and disadvantages from the embrittlement of hot-dip galvanized castings have been large. After a test of about two years the reliability of the new process seems established. The development of new heat-treating processes or the discovery of slight changes in present ones, together with variations in alloy composition, are going on constantly. Their possibilities are countless. There are several of these now under study, which promise much in savings and other benefits for several industries using steel in large quantities.

with which problems may be handled and by the decreased number of errors.

The bald statement in the article that "there is not a man, woman or child in the United States who would not be adversely affected by the compulsory enactment of the metric system of weights and measures" is directly contrary to the experience of all those who have had experience and are in the best position to know. The change to the metric system would be amply justified, even if it were no better than the present so-called English system, merely for the sake of uniformity all over the world, but it would be justified even without the benefit of uniformity, on its own individual merit.

The opposition to the metric system is headed by those either mentally aged or having some kind of axe to grind, either in the way of making a place for themselves, or to try and persuade advertisers that they are saving the said advertisers many millions of dollars, when as a matter of fact they are preventing them from gaining very great advantages, which the longer put off will, by their own theory, be the more difficult to accomplish, but are nevertheless inevitable.

THEODORE H. MILLER,  
Works Manager De Laval Separator Co.  
Poughkeepsie, N. Y.

### CORRESPONDENCE

#### Favors the Metric System

*To the Editor:* I note with interest and not a little amazement your editorial at page 429 of the Feb. 11 issue of THE IRON AGE entitled "An Imminent Metric Danger," and it seems strange that your publication, along with some others whose primary purpose of existence is to try and get others to accept new and advanced ideas and to break away from their old habits and traditions in regard to mechanical matters in general, should take such a stand as you do on the metric question.

The writer of this editorial must of course know that even with all the merits and advantages, which any sane person freely admits is inherent in the decimal money system, that system never would have come into general use, excepting that it was made the *only* legal standard.

In spite of the strong ties of habit and inertia among the people, it is nevertheless not true, as the article states, that "the metric system has come into only trifling use in the last 60 years." The electricians, the chemists and the scientists, to mention only three groups, have made general and almost exclusive use of it, and it has made rapid progress along other lines as well. It is really no use trying to depreciate these men or to ridicule them and try to make out that they really are idealists and do not know what they are doing.

There has been plenty of testimony, which the writer of the editorial must have been aware of, if his ordinary common sense did not tell him, anyway, that there not only is no necessity, but no intention of "scrapping patterns, jigs, gages," etc., now in existence simply because it is proposed to call their dimensions by other names and other units.

Having been trained in the English system and having had 15 years' experience with the metric system in a rather large industry puts me in a position to say that the claim about its costing \$200 per worker to make the change is the veriest rot and to assert, on the basis of having made the change, that any cost attaching to the change will be more than gained in the very first year of operation by the increased facility

#### International Electrotechnical Commission Will Meet in New York in April

One of the lasting results of the sessions of the International Electric Congress which was held at the Louisiana Purchase Exposition, St. Louis, in 1904, was the organization of the International Electrotechnical Commission. This organization was completed in London in 1906, with Lord Kelvin as its first president, and has since been a powerful factor in the international standardization of the electrical industry.

The work of the commission has gradually broadened out both in its work and in its scope, until today 24 nations are participating in its activities. Charles Le-Maistre, of London, has served as secretary since the founding of the commission, and the president this year is M. Guido Semenza, of Italy.

While the program for the New York meeting is not yet complete, it is already known that over 125 delegates will attend and that important conferences of several standardizing bodies will take place. The delegates will also be conducted on a tour over the northeastern part of the United States, which will feature power plant visitations.

## CAST IRON PIPE

### Standardization of All Types and Processes Undertaken by A. E. S. C.—Large Committee of Makers and Users

A standardization project of far-reaching importance is about to be inaugurated through the formation of a representative committee on cast iron pipe which will undertake a general program of unifying existing specifications for pipe into a consistent set of nationally recognized specifications. This committee, which will be officially known as the sectional committee on standard specifications for cast iron pipe, is being sponsored by the American Gas Association, American Society for Testing Materials, American Water Works Association and New England Water Works Association and will function under the procedure of the American Engineering Standards Committee.

This development is the outcome of the submission two years ago by the American Gas Association of its standard specifications for cast iron pipe and special castings to the American Engineering Standards Committee for their approval as American Standard Specifications. It became evident that consideration of these specifications for such approval would involve the standardization of cast iron pipe in general, and at a conference held under the auspices of the American Engineering Standards Committee, which was very widely representative of industries that produce and use this product, it became clear that whereas dimensional standardization was principally involved in the specifications for gas pipe, a broader treatment of the whole problem was essential if results of the greatest benefits were to be obtained. Recently developed methods of producing cast iron pipe must be taken into consideration.

The American Gas Association was entirely willing to have the project broadened, and upon the recommendation of the conference the American Engineering Standards Committee agreed to set up a broad program of standardization of cast iron pipe under its auspices and invited the American Gas Association, American Society for Testing Materials, American Water Works Association and New England Water Works Association to sponsor the organization of a representative "sectional committee" to carry on the actual work of investigation and standardization.

The scope of the work has been defined as follows:

Unification of specifications for cast iron pipe, including materials; dimensions; pressure ratings; methods of manufacture (including such new developments as centrifugal casting), in so far as they may be necessary to secure satisfactory specifications; elimination of unnecessary sizes and varieties; consideration of the possibility of developing a coordinated scheme of metallic pipe and fittings applicable to all common mediums; and methods of making up joints in so far as they are determining factors in dimensional design of cast iron pipe.

The types of cast iron pipe to include: Bell and spigot pipe; flanged pipe; flanged and bell mouth fittings and wall castings; pipe elbows, tees, Y's, return bends, and other fittings not now included in standard lists; cast iron pipe threaded for flanges or couplings; soil pipe and other light types of cast iron pipe and fittings. The standardization is not to include methods of installing pipe and similar matters, except as to the making up of joints in its relationship to the dimensional standardization of pipe and fittings, as noted above.

The sponsors have been engaged in the details of organizing the sectional committee, which will comprise representative producers and users of cast iron pipe, and independent technical experts. Eleven technical societies and associations are represented in the work of the committee. This stage of the work is practically completed and the sponsors have announced the personnel of the committee, some of whom are as follows:

United States Bureau of Standards, I. J. Fairchild, Washington.

American Society for Testing Materials, Dr. Richard Moldenke, consulting metallurgist, Watchung.

N. J., and S. R. Church, technical adviser, The Barrett Co., New York.

American Cast Iron Pipe Co., W. D. Moore, president, Birmingham, Ala.

J. B. Clow & Sons, Kent S. Clow, vice-president, Chicago.

Glamorgan Pipe & Foundry Co., A. M. Campbell, Lynchburg, Va.

Lynchburg Foundry Co., W. G. Hammerstrom, Lynchburg, Va.

National Cast Iron Pipe Co., A. M. Ford, assistant engineer, Birmingham.

R. D. Wood & Co., Walter Wod, 400 Chestnut Street, Philadelphia.

Warren Foundry & Machine Co., Shellman B. Brown, superintendent, Phillipsburg, N. J.

United States Cast Iron Pipe & Foundry Co., N. F. S. Russell, president; D. P. Hopkins, vice-president, Burlington, N. J.; D. B. Stokes, general sales manager, Burlington, N. J.

## January Shipments of Sheets Heavy

### Records of Independent Manufacturers Show Excess Over December But Drop in Sales

The monthly report of the National Association of Sheet and Tin Plate Manufacturers provides ample verification of the common impression ruling last month as to the sheet steel business. The figures, just released, show that sales of the independent manufacturers reporting to the association decreased 66,181 tons as compared with December, but shipments for last month ran 39,906 tons ahead of those for December, while there was a gain in January production as compared with the month before of 1683 tons. The figures plainly indicate that consumers specified with much freedom against contracts and depended more on shipments on these contracts for supplies than upon freshly placed orders.

Unfilled orders decreased 68,704 tons for the month, while stocks on hand awaiting shipping instructions fell approximately 15,000 tons, but there was an increase in unsold stocks of 16,140 tons. The loss in unfilled business and the gain in unsold stocks amounted to 84,844 tons, as against an excess of shipments over sales in January of 80,162 tons. The figures in detail follow:

	Status of Business of Independent Sheet Makers			
	1926	1925	January	December
Number of mills.....	711	712	714	701
Capacity per month.....	420,800	433,700	416,000	428,600
Per cent reporting.....	74.8	74.9	74.9	75.6
Sales.....	253,323	319,504	370,361	241,040
Production.....	328,643	326,960	336,021	317,424
Shipments.....	333,485	293,579	294,660	283,645
Unfilled orders.....	609,293	677,907	636,570	607,190
Unshipped stocks.....	110,671	126,328	107,177	91,363
Unsold stocks.....	55,295	39,155	36,105	49,460

Percentages to Capacity				
Sales .....	80.4	101.8	122.8	74.4
Production .....	104.4	100.7	107.8	98.0
Shipments .....	105.9	93.5	97.7	87.6
Unfilled orders .....	193.5	215.9	211.1	187.5
Unshipped stocks .....	35.1	38.9	34.4	28.2
Unsold stocks .....	17.6	12.1	11.6	15.3

## Buys United States Malleable Iron Co.

The plant of the United States Malleable Iron Co., Toledo, Ohio, has been sold by the Federal Court on a bid of \$418,931 to Ira L. Houghton and associates, who have incorporated a new company to operate the plant under the name of the Peerless Malleable Iron Co., with a capital stock of \$250,000. Mr. Houghton was vice-president and general manager of the old company.

The manner in which a budget ties together the three phases of management, namely financial, sales and production control will be discussed at a meeting of the New York chapter of the Society of Industrial Engineers, to be held at the Cafe Boulevard, New York, on the evening of March 2. The main address will be given by Dwight T. Farnham, manager of the industrial department of Peat, Marwick Mitchell & Co., New York. John J. Long, Hudson Brass Works, Brooklyn, N. Y., will lead the discussion.

# Iron and Steel Markets

## Await the Turn of Next Few Weeks

Production Continues High and Is Catching Up on Orders—  
Some Opening of Books for Second Quarter at  
Current Prices—Pig Iron Halting

**N**O significant change in rate of operations has recently occurred. Production continues at a remarkably high level with shipments averaging probably 5 to 10 per cent more than the combined tonnage of specifications and new business.

The next two or three weeks are expected to tell the story of the second quarter, now that rolling mills are well scheduled up to that period. Most dependable signs point to a continued policy of buying closely according to needs, fears of scarcity or marked price advances being absent. And these needs, so far as direct evidence sheds any light, promise to remain notably heavy.

Efforts to stiffen prices appear rather general. They are represented in fewer concessions being obtained, as in sheets and plates, and in the naming of some present quotations for second quarter business. In sheets the American Sheet & Tin Plate Co. continues its first quarter prices, so that there is some expectation that the sheet market as a whole will again rise to this level. Several mills have opened books for hot and cold rolled strip steel on the basis of prices now prevailing.

January statistics give some measure of current demand. Sales of sheets by independent manufacturers, while considerably off from December, were 8 per cent more than in January, 1925. Likewise unfilled orders, 10 per cent lower at the end than at the beginning of the month, were more than they were a year ago.

Bookings of fabricated steel in January fell off 21 per cent from those of December, but a year ago the drop was 27 per cent, and January a year ago did not provide as much business as it did this year.

Production of automobiles last month was not up to December, but was 23 per cent above January, 1925. The output of steel barrels exceeded that of January of last year by nearly 12 per cent. Bookings of commercial steel castings also were in excess of those a year ago.

Improvement in structural steel is reflected in the week's awards of about 35,000 tons and inquiries for 32,000 tons.

Purchases of 4904 freight cars and 24 locomotives and inquiries for 2762 cars and 138 locomotives featured the railroad equipment market. The Seaboard Air Line bought 3400 cars, while the Southern wants 2250 cars and 113 locomotives.

An inquiry has appeared for two Lake boats taking 10,000 tons of steel.

Between 60,000 and 70,000 tons of line pipe are wanted for gas and oil lines by three companies.

With blast furnace coke at \$3.75, Connellsville,

25c. a ton below the first quarter contract price, pig iron buyers are waiting the effect on iron prices. At Chicago and in the East a few large buyers are sounding out the market for second quarter. At Philadelphia small sales for second quarter have been made at \$22.50, furnace, a decline of 50c. a ton.

Three blast furnaces in the Pittsburgh district which banked to divert coke to the open market have resumed operation, and another, out for the same reason, will go in March 1.

Pig iron freight rates from the Ironton district to Cincinnati, Dayton, Springfield, Columbus and intermediate points in Ohio have been reduced. The rate to Cincinnati is now \$1.89, a drop of 38c. a ton, and others are proportionate.

Spot tin was quoted at 64.75c. per lb., New York, on Feb. 23, higher than at any time in 1925, and visible supplies declining, the fact is of interest to the tin plate trade.

An Eastern steel company is negotiating for a quantity of foreign iron ore up to 250,000 tons.

Uniform prices for export on seamless pipe have been agreed upon by the five producing nations of Continental Europe. France, Luxemburg and Belgium have established 340 fr. at Antwerp (about \$15.40) for foundry iron.

Japan is inquiring here for two lots of rails, each of about 3000 tons. A British mill sold 25,000 tons to Argentina.

THE IRON AGE pig iron composite price dropped to \$21.46 this week, the first change since \$21.54 was established on Dec. 1. It was \$22.50 one year ago.

## Pittsburgh

Steel Market Has Improved Tone—Coke Drops Lower, Pig Iron Buyers Wait

PITTSBURGH, Feb. 23.—If there has been improvement in the steel situation in the past week, it has been in the tone of the market rather than in the volume of business. With prices of the heavy tonnage products back where they were last fall and other lines at levels which manufacturers regard as irreducible from a cost standpoint, there seems to be a stronger stand at present quotations than was true even as recently as a week ago. Business is not satisfactory, but neither is it entirely unsatisfactory when it is considered that the winter has been one of unusual severity and has undoubtedly affected consumption. This, at any rate, is the common attitude toward the situation, and there is also a widespread belief that as the weather opens up there will be a material quickening in demand.

The automotive industry is expected in the next 30 days to be as prolific a source of business as it has been

## A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics  
At Date, One Week, One Month, and One Year Previous

### For Early Delivery

Pig Iron, Per Gross Ton:	Feb. 23, 1926	Feb. 16, 1926	Jan. 26, 1926	Feb. 24, 1925
No. 2X, Philadelphia	\$23.76	\$24.26	\$24.26	\$25.01
No. 2, Valley furnace	20.50	20.50	20.50	22.00
No. 2, Southern, Cin'tif.	25.69	25.69	25.69	24.05
No. 2, Birmingham, Ala.	22.00	22.00	22.00	20.00
No. 2 foundry, Ch'go furn.	23.00	23.00	23.00	24.00
Basic, del'd, eastern Pa.	23.00	23.00	23.00	23.75
Basic, Valley furnace	20.00	20.00	20.00	22.00
Valley Bessemer del'd P'gh	22.76	22.76	22.76	24.26
Malleable, Chicago furn.	23.00	23.00	23.00	24.00
Malleable, Valley	20.50	20.50	20.50	22.00
Gray forge, Pittsburgh	21.76	21.76	21.76	23.26
L. S. charcoal, Chicago	29.04	29.04	29.04	29.04
Ferromanganese, furnace	115.00	115.00	115.00	115.00

Rails, Billets, etc., Per Gross Ton:	Feb. 23, 1926	Feb. 16, 1926	Jan. 26, 1926	Feb. 24, 1925
O.-h. rails, heavy, at mill	\$43.00	\$43.00	\$43.00	
Bess. billets, Pittsburgh	35.00	35.00	35.00	37.00
O.-h. billets, Pittsburgh	35.00	35.00	35.00	38.00
O.-h. sheet bars, P'gh	36.00	36.00	36.00	38.00
Forging billets, base, P'gh	40.00	40.00	40.00	42.50
O.-h. billets, Phila.	40.30	40.30	41.30	41.67
Wire rods, Pittsburgh	45.00	45.00	45.00	48.00
Light rails at mill	36.00	36.00	36.00	40.32
Skelp, gr. steel, P'gh, lb.	1.90	1.90	1.90	2.10

Finished Iron and Steel,	Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	2.22	2.22	2.22	2.28	
Iron bars, Chicago	2.00	2.00	2.00	2.10	
Steel bars, Pittsburgh	2.00	2.00	2.00	2.10	
Steel bars, Chicago	2.10	2.10	2.10	2.20	
Steel bars, New York	2.34	2.34	2.34	2.44	
Tank plates, Pittsburgh	1.80	1.80	1.80	2.00	
Tank plates, Chicago	2.10	2.10	2.10	2.30	
Tank plates, New York	2.09	2.09	2.09	2.34	
Beams, Pittsburgh	1.90	1.90	1.90	2.10	
Beams, Chicago	2.10	2.10	2.10	2.30	
Beams, New York	2.24	2.24	2.24	2.44	
Steel hoops, Pittsburgh	2.50	2.50	2.50	2.50	

\*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

### THE IRON AGE Composite Prices

#### Finished Steel

Feb. 23, 1926, 2.424c. Per Lb.

One week ago	2.424c.
One month ago	2.439c.
One year ago	2.546c.
10-year pre-war average	1.689c.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets. These products constitute 88 per cent of the United States output of finished steel.

High	Low
1925 2.560c.,	Jan. 6 2.396c.,
1924 2.789c.,	Jan. 15 2.460c.,
1923 2.824c.,	April 24 2.446c.,

#### Pig Iron

Feb. 23, 1926, \$21.46 Per Gross Ton

One week ago	\$21.54
One month ago	21.54
One year ago	22.50
10-year pre-war average	15.72

Based on average of basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham.

High	Low
1925 \$22.50,	Jan. 13 \$18.96,
1924 22.88,	Feb. 26 19.21,
1923 30.86,	March 20 20.77,

a barren one since the opening of the year. Releases against specifications by motor car builders have shown some increase lately, but still are small in relation to the amount of business contracted for. It is significant, however, that their demands call for very prompt deliveries, suggesting very small stocks. Makers of automobile steels feel that much business is being dammed up, and are encouraged to a firm stand on prices by the fact that they do not recall a time when the winter plans of the automotive industry ever materialized before the advent of spring. It is believed that other consuming industries also have subnormal stocks, which must soon be expanded under the impetus of increased open weather consumption.

It can still be said that the steel industry at large

is refraining from production in excess of actual business, and this is a helpful factor in price maintenance. The American Sheet & Tin Plate Co., as of last Saturday, opened its books for second quarter sheet business, naming the same prices as for first quarter except on automobile body sheets, which are quoted at 4.40c., recognizing the price made earlier in the month. Prices below 3.35c., base Pittsburgh, for black, 4.60c., base, for galvanized, and 2.50c. for blue annealed still are being made, but do not appear to be quite so common as a week ago. Several of the makers of strip steel have announced a continuance of present prices on second quarter business; these prices are 2.30c., base Pittsburgh, on hot-rolled strips, 6 in. and wider, and 2.50c. for material narrower than 6 in., and 3.90c., base,

on cold-rolled strips. In a general way, it is probable that second quarter prices will be the same as those for the present quarter.

Hardly enough business has been done in pig iron lately to develop a definite price trend. Buyers seem satisfied that they have something to gain by waiting, especially as the coke market has receded further since a week ago and is now below the contract prices for first quarter tonnages. Three of the blast furnaces in this and nearby districts that were banked to release coke for the domestic market have resumed, and another one is scheduled to resume production March 1.

A continued decline in scrap prices also is disturbing to pig iron producers since there is now a spread of \$2.50 to \$3 a ton between basic pig iron and heavy melting steel.

**Pig Iron.**—The largest transaction in the past week is one amounting to 1100 tons of foundry iron for a northern Pennsylvania melter engaged in manufacturing oil well supplies. All other business probably has not been in excess of that amount. While producers have had no particular trouble in obtaining recent prices on carload lots, there is not enough interest in the market on the part of large melters to determine just what sizable tonnages could be sold for. Spot coke is as low as \$3.75 per net ton at ovens, and it now looks as though second quarter contracts could be placed at that figure, which is 25c. a ton below the average on first quarter tonnage. The large lot of foundry iron mentioned appears to have been sold at less than \$20.50, base at Valley furnace, but does not seem to have been placed with any of the furnaces in the Valley district. The melt of foundry iron in this district appears to have increased in the past week or 10 days because of the easier coke situation. For a time during the high prices for domestic coke the foundries could not get sufficient supplies of coke and were disposed to curtail melting. This situation has been corrected through the ending of the anthracite strike, and pig iron producers again are reporting decreases in their yard stocks. The Pittsburgh Crucible Steel Co., the Pittsburgh Steel Co., and the Struthers Furnace Co., have put on furnaces that were banked to release coke, and the Clinton Iron & Steel Co., which suspended for the same reason, will put its furnace into production March 1. The Claire furnace of the Reliance Coke & Furnace Co., Sharpsville, Pa., will probably remain out of blast until about April 1.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being \$1.76 per gross ton:

Basic	\$20.00
Bessemer	21.00
Gray forge	20.00
No. 2 foundry	20.50
No. 3 foundry	20.00
Malleable	20.50
Low phosphorus, copper free	\$28.00 to 28.50

**Ferroalloys.**—The market is active in the way of specifications on contracts, but not much new business is coming out. Consumers of spiegeleisen are taking shipments especially freely; full quotas have been specified by all users and some are exceeding them, one with a contract for 1600 tons for shipment over the first half of the year already having ordered out 900 tons. There is a scarcity of 19 to 21 per cent material for shipment between now and June 30. Some English 20 per cent spiegeleisen is being offered at \$35, Atlantic seaboard. There is no weakening of ferromanganese prices, but tonnages of a size to induce shading are not before the market. Prices are given on page 587.

**Semi-Finished Steel.**—There is no new buying worthy of mention in the various forms of semi-finished steel, since coverages provided by contracts are proving amply sufficient for the requirements of the non-integrated producers. Indeed, it begins to look as though some first quarter tonnages might be carried over into the second quarter, since specifications lately have been lagging. Nothing yet has been done about second quarter supplies, but the belief holds that makers will try to continue present prices. A rally in finished steel business in the next few weeks would be helpful to price maintenance. The course of the sheet market also will be an influence. Sheet bar prices are governed more by the prices of sheets than are the prices of

sheets by the cost of the sheet bars. Billets have sold at times at even prices with sheet bars, but the more common alignment is for billets to be at a discount from sheet bars. Wire rods are moving steadily on contracts. Skelp is dull. Prices are given on page 587.

**Wire Products.**—There is a steady flow of orders and specifications and, compared with January, a fairly good gain in volume. It is believed that the crest of the winter has been passed and jobbers appear to be preparing for the larger demands that will come with lengthening days and weather more favorable for outdoor work. To date the ability of manufacturers to meet all demands has not been taxed, but by contrast with other years under similar conditions, there is remarkable adherence to quoted prices. Manufacturers do not see the possibility of a greatly increased demand at prices below those now ruling and it would take a large gain in business to bring about a rise in mill operations sufficient to reduce costs. Prices are given on page 585.

**Tubular Goods.**—Reports about pipe business are generally favorable. Oil country jobbers are increasing their specifications for stock in anticipation of spring drilling activities, which are expected to be heavy this year on account of the constant decline over the past few months in production and the upward tendency of oil prices. There is also the promise of much laying of pipe lines. Meanwhile, as spring approaches and plans mature for new house and building construction, standard pipe is being ordered with more freedom. The gain in business has not yet brought about much improvement in pipe mill operations, because mill stocks are sufficient to take care of a good part of current demands. It is hard for the market for boiler tubes to develop much strength because there are so many sellers in relation to the number of buyers. Discounts are given on page 585.

**Bolts, Nuts and Rivets.**—Although \$2.60, base, per 100 lb. is the contract price on large rivets, no large sales are possible at that figure, the more common price being \$2.50, while carload lot buyers are getting concessions even from that price. Bolt and nut business is keeping up to the average for January and that month with some local makers was the best since 1923. Prices and discounts are given on page 587.

**Sheets.**—The American Sheet & Tin Plate Co., as of Feb. 20, announced a continuance of its present quotations for second quarter business. Independent companies so far have made no formal announcements as to second quarter prices, but in view of the fact that some of them have been holding firmly to prices of the American Sheet & Tin Plate Co., it is probable that they will duplicate its action. Lower prices have not disappeared, but the report is that there has been a considerable stiffening of the price views of those who were most active in making concessions recently. Specifications still are light for automobile body sheets, but they are averaging well in other finishes, the American Sheet & Tin Plate Co. reporting last week's shipping orders to have been in excess of 85 per cent of the weekly average of its two best years in sheet shipments. This was without much automobile body sheet tonnage included. Current production of sheets still holds at about 75 per cent of capacity. Prices are given on page 585.

**Tin Plate.**—Tin plate is still in active demand. A brisk call for stock items and very meager supplies stand out as features. One explanation of the light stocks is that American makers are disposed to concentrate on food container business and give less attention to oil can sizes which, being on an export basis as to prices, yield less profit. Moreover, a smaller production of oil can sizes has meant fewer wasters or seconds.

**Hot-Rolled Flats.**—There has been some decline in business because of the cautious policy of the automotive industry, but as a rule makers have a fair amount of business before them and are holding firmly to recent prices. These, which are 2.30c., base Pittsburgh, for material 6 in. and wider, and 2.50c. for stock narrower than 6 in., have been announced by some makers as the second quarter contract figures.

# Prices of Finished Iron and Steel Products (Carload Lots)

## Iron and Steel Bars

### Soft Steel

	Base Per Lb.
F.o.b. Pittsburgh mills	.200c.
F.o.b. Chicago	.210c.
Del'd Philadelphia	.232c.
Del'd New York	.234c. to .244c.
Del'd Cleveland	.219c.
F.o.b. Birmingham	.215c. to .225c.
C.i.f. Pacific ports	.235c.
F.o.b. San Francisco mills	.235c. to .240c.

### Billet Steel Reinforcing

F.o.b. Pittsburgh mills	.190c.
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### Rail Steel

F.o.b. mill	.180c. to .190c.
F.o.b. Chicago	.200c.

### Iron

Common iron, f.o.b. Chicago	.200c.
Refined iron, f.o.b. P'gh mills	.300c.
Common iron, del'd Phila'phi'a	.222c.
Common iron, del'd New York	.224c.

### Tank Plates

	Base Per Lb.
F.o.b. Pittsburgh mill	.180c. to .190c.
F.o.b. Chicago	.210c.
F.o.b. Birmingham	.195c. to .205c.
Del'd Cleveland	.199c. to .208c.
Del'd Philadelphia	.207c. to .212c.
Del'd New York	.209c. to .214c.
C.i.f. Pacific ports	.230c.

### Structural Shapes

	Base Per Lb.
F.o.b. Pittsburgh mill	.190c. to .200c.
F.o.b. Chicago	.210c.
F.o.b. Birmingham	.205c. to .215c.
Del'd Cleveland	.209c. to .219c.
Del'd Philadelphia	.212c. to .222c.
Del'd New York	.224c. to .234c.
C.i.f. Pacific ports	.235c.

### Hot-Rolled Flats (Hoops, Bands and Strips)

	Base Per Lb.
All gages, narrower than 6 in., P'gh	.250c.
All gages, 6 in. and wider, P'gh	.230c.
All gages, 6 in. and narrower, Chicago	.260c.
All gages, wider than 6 in., Chicago	.250c.

### Cold-Finished Steel

	Base Per Lb.
Bars, f.o.b. Pittsburgh mills	.250c.
Bars, f.o.b. Chicago	.250c.
Bars, Cleveland	.255c.
Shafting, ground, f.o.b. mill	.270c. to .300c.
Strips, f.o.b. Pittsburgh mills	.390c.
Strips, f.o.b. Cleveland mills	.390c.
Strips, delivered Chicago	.420c.
Strips, f.o.b. Worcester mills	.405c.

\*According to size.

### Wire Products

(To jobbers in car lots f.o.b. Pittsburgh and Cleveland)

	Base Per Keg
Wire nails	\$2.65
Gal'd nails, 1-in. and longer	4.65
Gal'd nails, shorter than 1 in.	4.90
Galvanized staples	2.85
Polished staples	3.10
Cement coated nails	2.65

	Base Per 100 Lb.
Bright plain wire, No. 9 gage	\$2.50
Annealed fence wire	2.65
Spring wire	3.50
Gal'd wire, No. 9	3.10
Barbed wire, gal'd	3.35
Barbed wire, painted	3.10

Chicago district mill and delivered Chicago prices are \$1 per ton above the foregoing. Birmingham mill prices \$3 a ton higher; Worcester, Mass., mill \$3 a ton higher on production of that plant; Duluth, Minn., mill \$2 a ton higher; Anderson, Ind., \$1 higher.

### Woven Wire Fence

	Base to Retailers Per Net Ton
F.o.b. Pittsburgh	\$65.00
F.o.b. Cleveland	65.00
F.o.b. Anderson, Ind.	66.00
F.o.b. Chicago district mills	67.00
F.o.b. Duluth	68.00
F.o.b. Birmingham	68.00

### Sheets

#### Blue Annealed

	Base Per Lb.
Nos. 9 and 10, f.o.b. Pittsburgh	.245c. to .250c.
Nos. 9 and 10, f.o.b. Ch'go dist. mills	.260c.
Nos. 9 and 10, del'd Phila'phi'a	.282c.

#### Box Annealed, One Pass Cold Rolled

	Base Per Lb.
No. 28, f.o.b. Pittsburgh	.825c. to .835c.
No. 28, f.o.b. Ch'go dist. mill	.845c.

#### Galvanized

	Base Per Lb.
No. 28, f.o.b. Pittsburgh	.450c. to .460c.
No. 28, f.o.b. Chicago dist. mill	.470c.

#### Tin Mill Black Plate

	Base Per Lb.
No. 28, f.o.b. Pittsburgh	.825c. to .835c.

#### Long Ternes

No. 28, 8-lb. coating, f.o.b. mill	.485c.
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#### Tin Plate

	Per Base Box
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Standard cokes, f.o.b. P'gh district mills... \$5.60

Standard cokes, f.o.b. Gary and Elwood, Ind. .... 5.60

### Alloy Steel Bars

(F.o.b. Pittsburgh or Chicago)

S. A. E. Series Numbers	Base Per 100 Lb.
2100* (1/2% Nickel, 0.10% to 0.20% Carbon)	\$3.20 to \$3.25
2300 (3 1/2% Nickel)	4.50 to 4.60
2500 (5% Nickel)	5.70 to 5.80
3100 (Nickel Chromium)	3.50 to 3.60
3200 (Nickel Chromium)	5.00 to 5.25
3300 (Nickel Chromium)	7.00 to 7.25
3400 (Nickel Chromium)	6.25 to 6.50
5100 (Chromium Steel)	3.50
5200* (Chromium Steel)	7.00 to 7.50
6100 (Chrom. Vanadium bars)	4.20 to 4.30
6100 (Chrom. Vanad. spring steel)	3.80
9250 (Silicon Manganese spring steel)	3.20 to 3.25
Carbon Vanadium (0.45% to 0.55% Carbon)	4.10 to 4.20
Nickel Chrome Vanadium (0.60 Nickel, 0.50 Chrom., 0.15 Vanad.)	4.45 to 4.55
Chromium Molybdenum bars (0.80—1.10 Chrom., 0.25—0.40 Molyb.)	4.25 to 4.85
Chromium Molybdenum bars (0.50—0.70 Chrom., 0.15—0.25 Molyb.)	3.40 to 3.50
Chromium Molybdenum spring steel (1—1.25 Chrom., 0.30—0.50 Molybdenum)	4.50 to 4.75

Above prices are for hot-rolled steel bars, forging quality. The ordinary differential for cold-drawn bars is 1c. per lb. higher. For billets 4 x 4 to 10 x 10 in. the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4 in. down to and including 2 1/2-in. squares, the price is \$5 a gross ton above the price of the 4 x 4 billet price.

\*Not S. A. E. specifications, but numbered by manufacturers to conform to S. A. E. system.

### Rails

#### Per Gross Ton

Standard, f.o.b. mill	\$43.00
Light (from billets), f.o.b. mill	\$35.00 to 36.00
Light (from rail steel), f.o.b. mill	33.00 to 34.00
Light (from billets), f.o.b. Ch'go mill	36.00 to 38.00

### Track Equipment

(F.o.b. Mill)

#### Base Per 100 Lb.

Spikes, 1/2 in. and larger	\$2.80 to \$3.10
Spikes, 1/4 in. and smaller	3.00 to 3.50
Spikes, boat and barge	3.25
Track bolts, all sizes	4.00 to 4.50
Tie plates, steel	2.25 to 2.35
Angle bars	3.75

### Welded Pipe

Base Discounts f.o.b. Pittsburgh District and Lorain, Ohio, Mills

#### Butt Weld

Steel Inches	Black	Galv.	Iron Inches	Black	Galv.
1/2	45	19 1/2	1/4 to 1 1/2	+11	+39
1/4 to 3/4	51	25 1/2	1/2	23	2
5/8	56	42 1/2	1/4	28	11
3/4	60	48 1/2	1 to 1 1/2	30	13
1 to 3	62	50 1/2			

#### Lap Weld

2	55	43 1/2	2	.....	23	7
2 1/2 to 6	59	47 1/2	2 1/2	.....	26	11
7 and 8	66	48 1/2	3 to 6	.....	28	13
9 and 10	64	41 1/2	7 to 12	.....	36	11
11 and 12	61	50 1/2				

#### Lap Weld, extra strong, plain ends

2	58	42 1/2	2	.....	23	9
2 1/2 to 4	57	46 1/2	2 1/2 to 4	.....	29	15
4 1/2 to 6	56	45 1/2	4 1/2 to 6	.....	28	14
7 to 8	52	39 1/2	7 to 8	.....	21</td	

**Cold-Rolled Strips.**—The present base of 3.90c., Pittsburgh, has been announced as the second quarter price by several makers. On cold-rolled strip fender stock there is a price of 5.35c. net per lb. for No. 20 gage and 5.40c. for No. 22 gage, these prices representing a reduction of \$1 a ton. This material is related as to prices to automobile body sheets. The latter have declined \$2 per ton from the recent high point, but the strip fender stock did not move up from its low levels of last year to the extent that the body sheets did. The cautious policy of the automobile builders has made February rather a poor month, as compared with last month.

**Steel and Iron Bars.**—On ordinary tonnages the market here is very steady at 2c., base Pittsburgh, on merchant steel bars, and mills are encountering no resistance to that figure from the small lot users. On sizable tonnages and on business emanating from the large users, there is the usual preferential of \$1 to \$2 per ton. In other words, the market is back to about the basis of last fall. There is a steady demand for steel bars and specifications from contract customers are coming along well, but combined business does not set up a condition that makes for any lengthening of delivery promises. Iron bars are moving steadily at unchanged prices. Prices are given on page 585.

**Structural Steel.**—Incoming business with mills here is rather sluggish. Fabricating companies seem to have ordered out every pound against their fourth quarter contracts and appear to have been able to supply their requirements from these purchases without taking much against their contracts for this quarter. However, in view of fabricated steel business placed so far this year and the fact that much is pending, mills believe that a quickening in purchases and releases against contracts is not far off. So far as prices are concerned, the fabricators appear to have won out by their cautious buying policy. While there is still a quotation of 2c., base Pittsburgh, for large structural shapes, 1.90c. is more representative of today's possibilities and if local mills want business East or West, they find that even that price would have to be shaded. Prices are given on page 585.

**Plates.**—Recent distribution of 3400 cars by the Seaboard Air Line, calling for approximately 30,000 tons of rolled steel, most of the cars going to local shops, means some business for plate mills in this district. The general demand for plates, however, is well under the ability of local mills to supply, and only for small lots is the market quotable as high as 1.90c., base Pittsburgh, and mills here do not seem able to get that price beyond the confines of the so-called Pittsburgh district.

**Rails and Track Supplies.**—Light rails are definitely lower. On billet rails, the market now is quotable at \$35 to \$36 per gross ton, and rail steel rails also are \$1 a ton lower than they were recently. The story simply is one of active competition for business which, while of fair volume, is far from sufficient to engage productive capacity. Standard section rails are moving steadily against 1926 contracts. Specifications are good in the accessories, but not much new business is coming out. Mills here are still quoting tie plates at \$47 per net ton. Prices are given on page 585.

**Cold-Finished Steel Bars and Shafting.**—Specifications are good from all consuming industries except the automobile parts makers. There is a tendency on the part of those serving the automobile builders to keep specifications down to a minimum and then demand very prompt deliveries. Moreover, such resistance to prices as there is comes chiefly from that direction. Mills are holding firmly to prices, believing that there must be a change in policy among the motor car builders if they are going to carry out their plans for this year's production. Most makers have adopted a new card of extras on cold-finished alloy steel bars. The new card closely approximates the card on cold-finished carbon steel bars.

**Coke and Coal.**—As intimated in these reports a week ago beehive oven coke production could not be cut off as fast as demand fell following the settlement of the anthracite strike. Consequently, supplies in the

past week have been so plentiful in relation to demand that the market has declined another dollar a ton or more. The spot market now is quotable at \$3.75 to \$4 per net ton at oven, and spot foundry coke \$4.75 to \$5.50, or roughly about one-third the price of two weeks ago. Interest in the market is low because most consumers are well covered by contracts for this quarter, and as there is an impression that even lower prices may be reached, there is no hurry to open negotiations for second quarter tonnages. The coal market still is favorable to buyers. Prices are given on page 587.

**Old Material.**—Business continues extremely slow in this market and prices, as represented by the small lots which have to be moved, are still favorable to buyers. It is a hard market for dealers. They cannot get scrap cheaply enough to throw down on their yards and they see a danger in going short of the market at present levels. It would probably be necessary to make a price of \$17 for heavy melting steel to induce a mill to take on a substantial tonnage, since under present operating conditions the small lots being pressed on the market are proving sufficient. A dealer in selling at that price would have to buy at \$16.50 to make a profit and there is no certainty that sufficient tonnage could be had at that figure. Present local prices preclude shipments to Pittsburgh from either New England or the West, particularly the former, since \$16 is obtainable in eastern Pennsylvania and New England shippers are disinclined to ship to western Pennsylvania points at merely the difference in freight, or \$1.30 per ton. It would take close to \$18 here to take New England scrap away from eastern Pennsylvania mills at \$16, and \$17.50 is now the top of the market here. Not much change is noted in prices from those of a week ago; on heavy melting grade \$17.50 now is the maximum, and with demand gone for coke for domestic use, there is not so much call for blast furnace scrap.

The Baltimore & Ohio Railroad is taking bids until noon, March 1, on 16,185 gross tons of scrap, and the Pennsylvania is offering a special list of about 5000 tons.

We quote for delivery to consumer's mill in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows:

*Per Gross Ton*

Heavy melting steel.....	\$17.00 to \$17.50
No. 1 cast, cupola size.....	17.00 to 17.50
Rails for rolling, Newark and Cambridge, Ohio; Cumberland, Md.; Huntingdon, W. Va., and Franklin, Pa. ....	19.00 to 19.50
Compressed sheet steel.....	15.50 to 16.00
Bundled sheets, sides and ends..	14.50 to 15.00
Railroad knuckles and couplers..	20.00 to 20.50
Railroad coil and leaf springs..	20.00 to 20.50
Low phosphorus blooms and billet ends ..	22.00 to 22.50
Low phosphorus plates and other material ..	21.00 to 21.50
Low phosphorus punchings.....	20.00 to 20.50
Railroad malleable .....	18.50 to 19.00
Steel car axles.....	22.00 to 23.00
Cast iron wheels.....	18.00 to 18.50
Rolled steel wheels.....	20.00 to 20.50
Machine shop turnings.....	13.00 to 13.50
Short shoveling turnings.....	13.50 to 14.00
Sheet bar crops.....	20.00 to 20.50
Heavy steel axle turnings.....	16.00 to 16.50
Short mixed borings and turnings	13.50 to 14.00
Heavy breakable cast.....	14.00 to 15.00
Stove plate .....	14.00 to 14.50
Cast iron borings.....	13.50 to 14.00
No. 1 railroad wrought.....	13.00 to 13.50
No. 2 railroad wrought.....	17.00 to 17.50

## Coke and Iron Consolidation Under One Management

Announcement of the merger of the Bon Air Coal & Iron Co., Nashville; the Chattanooga Coke & Gas Co., Chattanooga, and J. J. Gray, Jr., Rockdale, Tenn., brings together three iron and coke interests under a consolidated management under the name of the Tennessee Products Corporation, with offices in the American Trust Building, Nashville. The Bon Air company has three blast furnaces which have been inactive for some years, 200 beehive ovens and 20 chacoal ovens. The Chattanooga concern operates a by-product coke plant with 24 Semet-Solvay ovens and an annual output of 125,000 tons. J. J. Gray, Jr., operates one ferro-phosphorus stack with 12,000 tons annual capacity.

# Semi-Finished Steel, Raw Materials, Bolts and Rivets

## Semi-Finished Steel

F.o.b. Pittsburgh or Youngstown

### Billets and Blooms

Per Gross Ton

Rolling, 4-in. and over.....	\$35.00
Rolling, 2-in. and smaller.....	36.00
Forging, ordinary.....	40.00
Forging, guaranteed.....	45.00

### Sheet Bars

Per Gross Ton

Open-hearth or Bessemer.....	\$36.00
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### Slabs

Per Gross Ton

8 in. x 2 in. and larger.....	\$35.00
6 in. x 2 in. and smaller.....	36.00

### Skelp

Per Lb.

Grooved.....	1.90c.
Sheared.....	1.90c.
Universal.....	1.90c.

### Wire Rods

Per Gross Ton

Common soft, base, No. 5 to 1/2-in.....	\$45.00
Common soft, coarser than 1/2-in.....	\$2.50 over base
Screw stock.....	\$5.00 per ton over base
Carbon 0.20% to 0.40%.....	3.00 per ton over base
Carbon 0.41% to 0.55%.....	5.00 per ton over base
Carbon 0.56% to 0.75%.....	7.50 per ton over base
Carbon over 0.75%.....	10.00 per ton over base
Acid.....	15.00 per ton over base

\*Chicago mill base is \$46. Cleveland mill base, \$45.

## Raw Materials

### Ores

#### Lake Superior Ores, Delivered Lower Lake Ports

Per Gross Ton

Old range Bessemer, 51.50% iron.....	\$4.55
Old range non-Bessemer, 51.50% iron.....	4.40
Mesabi Bessemer, 51.50% iron.....	4.40
Mesabi non-Bessemer, 51.50% iron.....	4.25
High phosphorus, 51.50% iron.....	4.15

#### Foreign Ore, c.i.f. Philadelphia or Baltimore

Per Unit

Iron ore, low phos., copper free, 55 to 58%	
iron in dry Spanish or Algerian, 9.50c. to 10c.	
Iron ore, Swedish, average 66% iron.....	9.50c.
Manganese ore, washed, 51% manganese, from the Caucasus.....	45c.
Manganese ore, Brazilian or Indian, nominal.....	42c. to 44c.
Tungsten ore, high grade, per unit, in 60% concentrates.....	\$12.50 to \$14.00

Per Ton

Chrome ore, Indian basic, 48% Cr <sub>2</sub> O <sub>3</sub> , crude, c.i.f. Atlantic seaboard.....	\$22.00 to \$23.00
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Molybdenum ore, 85% concentrates of MoS <sub>2</sub> , delivered.....	55c. to 60c.
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### Coke

Per Net Ton

Furnace, f.o.b. Connellsville prompt.....	\$3.75 to \$4.00
Foundry, f.o.b. Connellsville prompt.....	4.75 to 5.50
Foundry, by-product, Ch'go ovens.....	10.50
Foundry, by-product, New England, del'd.....	13.00
Foundry, by-product, Newark or Jersey City, delivered.....	11.52

Foundry, Birmingham.....	5.75 to 6.00
Foundry, by-product, St. Louis or Granite City.....	10.00

### Coal

Per Net Ton

Mine run steam coal, f.o.b. W. Pa. mines.....	\$1.50 to \$2.00
Mine run coking coal, f.o.b. W. Pa. mines.....	1.90 to 2.25
Mine run gas coal, f.o.b. W. Pa. mines.....	1.90 to 2.15
Steam slack, f.o.b. W. Pa. mines.....	1.00 to 1.10
Gas slack, f.o.b. W. Pa. mines.....	1.10 to 1.25

### Ferromanganese

Per Gross Ton

Domestic, 80%, furnace or seab'd.....	\$115.00
Foreign, 80%, Atlantic or Gulf port, duty paid.....	115.00

### Spiegeleisen

Per Gross Ton Furnace

Domestic, 19 to 21%.....	\$32.00 to \$34.00
Domestic, 16 to 19%.....	31.00 to 33.00

### Electric Ferrosilicon

Per Gross Ton Delivered

50%.....	\$85.00
75%.....	145.00

Per Gross Ton Furnace

10%.....	\$42.00
11%.....	42.00

### Bessemer Ferrosilicon

F.o.b. Jackson County, Ohio, Furnace

Per Gross Ton	Per Gross Ton
10%.....	12%.....
11%.....	14 to 16%.....

### Silvery Iron

F.o.b. Jackson County, Ohio, Furnace

Per Gross Ton	Per Gross Ton
6%.....	\$28.50
7%.....	29.50
8%.....	30.50
9%.....	32.00

### Other Ferroalloys

Ferro tungsten, per lb. contained metal, del'd.....

\$1.15 to \$1.20

Ferrochromium, 4% carbon and up, 60 to 70% Cr. per lb. contained Cr. delivered.....

11.50c.

Ferrovanadium, per lb. contained vanadium, f.o.b. furnace.....

\$3.25 to \$4.00

Ferrocobaltitanium, 15 to 18%, per net ton, f.o.b. furnace, in carloads.....

\$200.00

Ferrophosphorus, electrolytic, or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per net ton.....

\$91.00

Ferrophosphorus, electrolytic, 24%, f.o.b. Anniston, Ala., per net ton.....

\$122.50

### Fluxes and Refractories

#### Fluorspar

Per Net Ton

Domestic, 85% and over calcium fluoride, not over 5% silica, gravel, f.o.b. Illinois and Kentucky mines.....	\$17.00 to \$17.50
Foreign, 85% calcium fluoride, not over 5% silica, c.i.f. Atlantic port, duty paid,.....	\$17.00 to \$17.50
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2 1/2% silica, f.o.b. Illinois and Kentucky mines.....	\$32.50

#### Fire Clay

Per 1000 f.o.b. Works

High Duty

Moderate Duty

Pennsylvania.....	\$43.00 to \$46.00
Maryland.....	48.00 to 50.00
Ohio.....	43.00 to 46.00
Kentucky.....	43.00 to 45.00
Illinois.....	43.00 to 45.00
Missouri.....	40.00 to 43.00
Ground fire clay, per ton.....	6.50 to 7.50

#### Silica Brick

Per 1000 f.o.b. Works

Pennsylvania.....	\$40.00
Chicago.....	49.00
Birmingham.....	54.00
Silica clay, per ton.....	\$8.00 to 9.00

#### Magnesite Brick

Per Net Ton

Standard size, f.o.b. Baltimore and Chester, Pa. ....	\$65.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa. ....	40.00

#### Chrome Brick

Per Net Ton

Standard size.....	\$48.00
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### Large Rivets

Base Per 100 Lb.

F.o.b. Pittsburgh.....	\$2.50 to \$2.60
F.o.b. Cleveland.....	2.70
F.o.b. Chicago.....	2.75

### Small Rivets

Per Cent Off List

F.o.b. Pittsburgh.....	70 and 10
F.o.b. Cleveland.....	70 and 10
F.o.b. Chicago.....	70 and 10 to 70 and 5

### Cap and Set Screws

(Freight allowed up to but not exceeding 50c. per 100 lb.)	
Per Cent Off List	

Milled cap screws.....	80 and 10
Milled standard set screws, case hardened.....	80
Milled headless set screws, cut thread.....	80
Upset hex. head cap screws, U. S. S. thread,.....	80, 10 and 10
Upset hex. cap screws, S. A. E. thread,.....	80 and 10

## Chicago

### Large Pig Iron Inquiries to Test Market— Mill Output Still Heavy

CHICAGO, Feb. 23.—The demand for finished steel has shown little change within the week. Tonnage passed on to entry at the mills is in excess of shipments, and new sales are at a rate about equal to deliveries. As a rule, buyers are still showing hesitancy in placing new business. This may be due in some measure to uncertainty as to the trend of the market, but undoubtedly satisfactory mill deliveries on practically all products are also an important factor.

Industries in and around Chicago are showing a fair degree of activity. A number of car builders are busier than they have been for several months. Farm implement makers continue to operate at about 75 per cent of capacity and are specifying liberally for their steel requirements. Forging plants and cold rollers are active, and business placed in this district by the automobile industry is in good volume.

Railroad car buying during the week has added little tonnage to Chicago mill books. Of 75 coaches contracted for, 55 were taken by a Western builder. The 4000 freight cars purchased were placed with Eastern plants. New inquiries total 3000 freight cars, of which probably not more than 1000 will be placed in this district. It is anticipated that 2300 cars for the Illinois Central and 500 for the Chicago & Eastern Illinois will be bought this week. Rail buying is slackening and mills hope to catch up with their delivery schedules at an early date.

Mill operations are unchanged, with the foremost interest close to 90 per cent of ingot capacity and the leading independent between 80 and 85 per cent. The Corporation continues to blow 19 out of 27 stacks, and the total count of active steel works furnaces stands at 27 out of 35 in the district.

Several large inquiries for pig iron have appeared, and they are expected to serve as a test of the market.

**Ferroalloys.**—Several carlots of ferromanganese have been sold at \$115, Seaboard, or \$122.56, delivered. No sales of ferrosilicon are reported, but sellers are receiving liberal specifications against contracts. Spiegel-eisen is showing some activity, and several carload sales of the 18 to 22 per cent grade have been made at \$34, furnace, or \$41.76, delivered.

We quote 80 per cent ferromanganese, \$122.56, delivered Chicago; 50 per cent ferrosilicon, \$85, delivered; spiegel-eisen, 18 to 22 per cent, \$41.76, delivered Chicago.

**Coke.**—This market shows no change, so far as by-product foundry coke is concerned. Prices remain \$10.50, ovens, and \$11, delivered in the Chicago switching district. The first shipments of coal from the Eastern anthracite fields are reported to have reached Chicago late in the week.

**Pig Iron.**—There is a growing feeling among users of pig iron that the present price level will not be maintained. Sellers, on the other hand, continue to quote \$23, Chicago furnace, for No. 2 foundry. Sales within the past few weeks have not been large in tonnage, but a number of heavy inquiries are before the trade, which will serve as a test of the market. Shipments for the week are at about the same rate as during the previous seven days, and it is now expected that February, although a short month, will show as large shipments as January. In view of the liberal specifications it is the general impression that melters are now making an effort to round out their stocks, which were allowed to run down during the holiday period and were not built up during January. A Milwaukee user who was inquiring for 2000 tons of Northern iron, has temporarily withdrawn from the market. A Chicago district melter is asking for 4000 to 5000 tons of foundry and malleable for delivery during March and the second quarter. Several foundries in this territory are expected to enter the market at an early date for from 1000 to 3000 tons each. A few sales of charcoal iron are reported at \$26, furnace, or \$29.04, delivered. Sev-

eral carlot sales of 8 per cent silvery have been made at \$30.50, base Jackson County, or \$35.29, delivered. Users have taken a few hundred tons of 14 to 16 per cent ferrosilicon at \$44, Jackson County, or \$48.79, delivered.

Quotations on Northern foundry, high phosphorus and malleable iron are f.o.b. local furnace, and do not include an average switching charge of 61c. per ton. Other prices are for iron delivered at consumers' yards.

Northern No. 2 foundry, sil. 1.75 to 2.25	\$23.00
Northern No. 1 foundry, sil. 2.25 to 2.75	23.50
Malleable, not over 2.25 sil.	23.00
High phosphorus	23.00
Lake Superior charcoal, averaging sil. 1.50, delivered at Chicago	29.04
Southern No. 2 (all rail)	\$27.01 to 28.01
Southern No. 2 (barge and rail)	26.18 to 27.18
Low phosph., sil. 1 to 2 per cent, copper free	31.20 to 31.70
Silvery, sil. 8 per cent	35.29
Ferrosilicon, 14 to 16 per cent	48.79

**Plates.**—Mills are interested in reports that oil producers expect to bring in a new field in the Panhandle district of Texas and that 20,000 tons in tanks may be required. Actual inquiry for tank material is not heavy. A car contract placed with a western builder has added 5000 tons of plates, shapes and bars to Chicago mills' books. New inquiries for 1000 hopper cars swell the total number of freight cars now before Western equipment makers to 8000. The placing of these cars will bring 80,000 tons of plates, shapes and bars to local mills. Chicago steel producers will not furnish any of the material for the 3400 cars placed by the Seaboard Air Line. The Pacific Car & Foundry Co., which was awarded 1000 refrigerator cars by the Pacific Fruit Express, has ordered the underframes from the Bettendorf Co. It is understood that these underframes are to be constructed largely of special sections and that the bulk of the tonnage required will be supplied by an Eastern mill. Plates show less strength in this market than other finished steel products, but the mill price of 2.10c., Chicago, is being maintained.

The mill quotation is 2.10c., Chicago. Jobbers quote 3.10c. for plates out of stock.

**Bars.**—Demand for soft steel bars continues to ease off, due in a measure to the present inactivity of the concrete bar market. Mill deliveries of this commodity are somewhat improved. Makers of farm implements continue to operate at a high rate and are specifying liberally. The ruling mill price remains at 2.10c., Chicago.

Makers of bar iron report that specifications are somewhat more liberal and that a fair number of small tonnage contracts for prompt shipment have been placed within the week. Mill operations are still virtually on a hand-to-mouth basis. A very small tonnage is emanating from car builders. No deviations are reported from the price of 2c., Chicago.

Rail steel bars are steady at 2c., Chicago, with the rate of demand unchanged. As a whole, barn equipment manufacturers are still enjoying a good volume of business and are forwarding liberal specifications to mills. Fence post manufacturers are unusually busy; in fact, both new business and specifications are said to be in excess of their ability to ship. One mill continues to operate on double turn, and another maker, operating on single turn, is making use of as much overtime as possible.

Mill prices are: Mild steel bars, 2.10c., Chicago; common bar iron, 2c., Chicago; rail steel bars, 2c., Chicago.

Jobbers quote 3c. for steel bars out of warehouse. The warehouse quotations on cold-rolled steel bars and shafting are 3.60c. for rounds and hexagons and 4.10c. for flats and squares; 4.15c. for hoops and 3.65c. for bands.

Jobbers quote hard and medium deformed steel bars at 2.60c., Chicago warehouse.

**Structural Material.**—The past week has brought a substantial amount of new tonnage before the trade, the outstanding inquiry being 5000 tons for an addition to the Crawford Avenue Station of the Commonwealth Edison Co., Chicago. Actual awards are not heavy, and there is keen competition for pending tonnages, keeping prices below the level which fabricators feel they would be justified in obtaining. Considerable com-

plaint is heard that contractors continue the practice of splitting tonnages, even on small contracts, thereby obtaining quicker delivery but working to the disadvantage of mills.

The mill quotation on plain material is 2.10c. Chicago. Jobbers quote 3.10c. for plain material out of warehouse.

**Rails and Track Supplies.**—Rail purchases of the week, consisting of miscellaneous small lots, totaled 12,000 tons. Local makers have also booked 4000 tons of rail joints. Practically all of the railroads serving this territory have contracted for their rail requirements, and the buying movement which began last fall is close to an end. Specifications have been generous, and although mills are operating close to capacity, shipments have not kept pace with the requirements of buyers. This situation, however, is gradually being overcome, and mills hope to meet delivery schedules at an early date.

Standard Bessemer and open-hearth rails, 43c. light rails, rolled from billets, \$36 to \$38 per gross ton, f.o.b. maker's mill.

Standard railroad spikes, 2.90c. to 3c. mill; track bolts with square nuts, 3.90c. to 4c. mill; steel tie plates, 2.25c., f.o.b. mill; angle bars, 2.75c., f.o.b. mill.

Jobbers quote standard spikes out of Chicago warehouse at 3.55c., base, and track bolts, 4.55c., base.

**Wire Products.**—This market has changed but little within the week, with prices unchanged and mills still on a 70 per cent production basis. Specifications from the manufacturing trade are being received at an unaltered rate, and it is believed that current production directed into that channel is being wholly converted into factory products. Jobbers continue to buy frequently and in small lots, not taking material any faster than current demand dictates. Dealers, as a rule, are optimistic over the prospects for a substantial spring trade, although they are showing no inclination at this time to build up stocks. This is largely accounted for by the fact that shipments in all lines are prompt and are moving forward without delay.

We quote warehouse prices f.o.b. Chicago: No. 8 black annealed wire, \$3.30 per 100 lb.; common wire nails, \$3.05 per keg; cement-coated nails, \$2.05 to \$2.20 per count keg.

**Cold Rolled Strip.**—This commodity is in greater demand, and makers have expanded operations. Prices remain unchanged at 3.90c., base Cleveland, or 4.20c., delivered Chicago.

**Sheets.**—Makers are encouraged over the turn which the market has taken within the last few days. Specifications have been heavier than in any like period since last November, and for the first time within a number of weeks mills have been able to arrange definite rolling schedules for a reasonable forward period. The present schedules are said to be better balanced than any the mills have worked on within the past two months. The fact that buying also is in fair volume is cause for further encouragement to the mills, since very little tonnage in new commitments has been added to their books since the turn of the new year. Some inquiry for second quarter has made its appearance, but producers will probably not open their books for that period until the first week in March. Makers are intently watching the trend of the spelter market, which at the moment is downward, for its influence in the cost of galvanized sheets. Prices in the Chicago district are steady at 3.45c., f.o.b. mill, for black, 2.60c. for blue annealed and 4.70c. for galvanized sheets.

Chicago delivered prices from mill are 3.50c. for No. 28 black, 2.65c. for No. 10 blue annealed and 4.75c. for No. 28 galvanized. Delivered prices at other Western points are equal to the freight from Gary plus the mill prices, which are 5c. per 100 lb. lower than the Chicago delivered prices.

Jobbers quote f.o.b. Chicago: 3.50c. base for blue annealed, 4.10c. base for black, and 5.25c. base for galvanized.

**Cast Iron Pipe.**—The City of Chicago will open bids March 2 on 5600 tons of 30-in. to 48-in. Class B pipe and 125 tons of fittings. St. Paul has not as yet closed on its inquiry for 600 tons, but bids are reported here as being within a range of \$41 to \$42 base Birmingham. The United States Cast Iron Pipe & Foundry Co. has taken 1600 tons for Harvey, Ill., 700 tons of 6 to 24-in. Class B for Rockford, Ill., and 300 tons for Toledo, Ill. The Chicago market continues quiet,

and although bids still range from \$41 to \$42, base Birmingham, on 6-in. and larger pipe, quotations appear to be working away from the lower figure toward the maximum. Buying by industrial and public utilities is unusually light.

We quote per net ton, delivered Chicago, as follows: Water pipe, 4-in., \$54.20; 6-in. and over, \$49.20 to \$50.20; Class A and gas pipe, \$4 extra.

**Bolts, Nuts and Rivets.**—Users continue to specify at an unchanged rate on all commodities except small rivets, demand for which has declined. Makers are now preparing to place new contracts before the trade for the second quarter. Discounts and prices are shown on page 587.

Jobbers quote structural rivets, 3.50c. per lb.; boiler rivets, 3.70c. per lb.; machine bolts up to  $\frac{1}{2}$  x 4 in., 50 and 5 per cent off; larger sizes, 50 and 5 off; carriage bolts up to  $\frac{1}{2}$  x 4, 47 $\frac{1}{2}$  off; larger sizes, 47 $\frac{1}{2}$  off; hot-pressed nuts, square, tapped or blank, \$3.25 off; hot-pressed nuts, hexagons, tapped or blank, \$3.75 off; coach or lag screws, 55 and 5 per cent off.

**Reinforcing Bars.**—The market is unusually quiet and less tonnage has been placed than for many weeks past. This is true not only of the larger jobs, but also of projects requiring less than 100 tons each. A substantial number of jobs are out for figures, but buyers are slow to sign contracts. The extra expense incidental to excavation work in frozen ground may be a contributing factor in the slowness of the present market. Bar stocks are said to be normal and shipments are moving forward without delay. Dealers are quoting 2.60c., Chicago warehouse, on billet steel reinforcing bars. New lettings and fresh inquiries are shown on page 597.

**Old Material.**—The local market continues dull, and although as a general rule prices have not changed within the week, the entire situation is weak with no immediate prospect of its becoming otherwise. Mills and large users generally appear to be definitely out of the market, and it is believed that stocks in the consumers' hands, in most cases are ample for all immediate requirements. Since the supply of practically all grades is still in excess of demand dealers are having no difficulty in obtaining scrap either for such new business as appears from time to time or for shipment against previous contracts. Railroad lists are being bid above the market, presumably by dealers who have past obligations to fill. A range of \$13.75 to \$14.25 for heavy melting steel is indicated by a few light tonnage purchases which were made at between \$13.85 and \$14.10. A recent railroad offering is said to have brought \$14.25 per gross ton, delivered.

We quote delivered in consumers' yards, Chicago and vicinity, all freight and transfer charges paid for all items except relaying rails, including angle bars to match, which are quoted f.o.b. dealers' yards:

Per Gross Ton	
Iron rails	\$16.50 to \$17.00
Cast iron car wheels	17.00 to 17.50
Relaying rails, 56 lb. to 60 lb.	25.00 to 26.00
Relaying rails, 65 lb. and heavier	26.00 to 31.00
Forged steel car wheels	18.00 to 18.50
Railroad tires, charging box size	18.00 to 18.50
Railroad leaf springs, cut apart	18.00 to 18.50
Rails for rolling	16.50 to 17.00
Steel rails, less than 3 ft.	17.50 to 18.00
Heavy melting steel	13.75 to 14.25
Frogs, switches and guards, cut apart	15.50 to 16.00
Shoveling steel	13.75 to 14.00
Drop forge flashings	11.00 to 11.50
Hydraulic compressed sheets	12.25 to 12.75
Axle turnings	15.00 to 15.50
Steel angle bars	16.50 to 17.00
Steel knuckles and couplers	17.00 to 17.50
Coil springs	18.50 to 19.00
Low phos. punchings	17.00 to 17.50
Machine shop turnings	8.75 to 9.25
Cast borings	11.75 to 12.25
Short shoveling turnings	11.75 to 12.25
Railroad malleable	17.50 to 18.00
Agricultural malleable	16.50 to 17.00

Per Net Ton	
Iron angle and splice bars	15.75 to 16.25
Iron arch bars and transoms	20.50 to 21.00
Iron car axles	25.00 to 25.50
Steel car axles	17.50 to 18.00
No. 1 busheling	11.00 to 11.50
No. 2 busheling	8.75 to 9.25
Pipes and flues	10.00 to 10.50
No. 1 railroad wrought	12.75 to 13.25
No. 2 railroad wrought	12.25 to 12.75
No. 1 machinery cast	17.00 to 17.50
No. 1 railroad cast	15.50 to 16.00
No. 1 agricultural cast	15.50 to 16.00
Locomotive tires, smooth	16.50 to 17.00
Stove plate	14.50 to 15.00
Grate bars	13.00 to 12.50
Brake shoes	12.50 to 13.00

## Boston

### Pig Iron Buyers Wait—Coke Remains Firm—Scrap Weak

BOSTON, Feb. 23.—The past week was one of the quietest experienced in the pig iron market in months. The settlement of the anthracite strike and the slump in Connellsburg coke prices evidently have created in the minds of buyers some misgivings as to the future of pig iron prices. Consequently there is a general tendency to withhold purchases pending developments. A little Buffalo district iron has been sold for second quarter delivery at \$21, base furnace, and eastern Pennsylvania iron has brought \$22 and \$22.50, base furnace, but the movement of other domestic irons is practically at a standstill. Foreign irons are accumulating at this port, and owners are pressing them for sale. Continental iron is offered at varying prices. Iron of 2.50 to 3 per cent silicon content is obtainable at \$20, \$20.50 and \$21, on dock duty paid, while higher silicones are offered at \$22 and \$22.50. Supplies of Indian iron have been cleaned up and the market is nominal at \$23, on dock duty paid. Reports that it has sold for less now prove erroneous. The Westinghouse Electric & Mfg. Co., Springfield, Mass., has not covered on its inquiry for 500 tons of No. 1X and 200 tons of No. 2X for second quarter, and a Holyoke, Mass., plant, wanting iron with deliveries running into September, has not closed.

We quote delivered prices on the basis of the latest sales as follows, having added \$3.65 freight from eastern Pennsylvania, \$4.91 from Buffalo, \$5.92 from Virginia, and \$9.60 from Alabama:

East. Penn., sil. 1.75 to 2.25.....	\$25.65 to \$26.15
East. Penn., sil. 2.25 to 2.75.....	26.15 to 26.65
Buffalo, sil. 1.75 to 2.25.....	25.91
Buffalo, sil. 2.25 to 2.75.....	26.41
Virginia, sil. 1.75 to 2.25.....	29.92
Virginia, sil. 2.25 to 2.75.....	30.42
Alabama, sil. 1.75 to 2.25.....	\$31.60 to 32.60
Alabama, sil. 2.25 to 2.75.....	32.10 to 33.10

**Coke.**—The New England coke situation remains unchanged, the demoralized Connellsburg situation notwithstanding. New England by-product coke makers are still far behind on domestic fuel deliveries, but are practically up to date on foundry coke specifications. Foundry coke remains at \$13 a ton, delivered within a \$3.10 freight rate zone, and no change is noted in domestic fuel prices. It is doubtful whether anthracite will arrive in New England in large amounts during the next week or 10 days, and it is equally doubtful whether demand for it will be so wide as it was before the strike owing to the large number of people who have learned to use coke. For these reasons it is believed that any readjustment of the coke situation will be much slower here than in other parts of the country.

**Cast Iron Pipe.**—Pawtucket, R. I., has awarded approximately 1000 tons of 6-in. to 16-in. pipe to the Warren Foundry & Pipe Co. Both French and German pipe makers underbid domestic foundries on the 600 tons of 6-in. to 12-in. required by Medford, Mass. It is unofficially reported the city has placed the business with an American company. Swampscoot, Mass., closed bids Feb. 19 on approximately 150 tons of 6-in. and 8-in. pipe but has not made an award, and Salem, Mass., closes bids Feb. 23 for about the same amount of pipe. A considerable amount of business was placed privately the past week, including about 300 tons of 6-in. to 24-in. pipe and fittings bought by the Mystic Iron Works, Everett, Mass., from the Warren Foundry & Pipe Co. A Connecticut city is sounding out the market on 750 tons of 6-in. and 8-in. pipe. No time has been set for closing.

**Old Material.**—Here and there a dealer reports a slight improvement in business, but the general market remains dull with prices heavy. Recent transactions include odd cars of heavy melting steel at \$11 and \$11.25, on cars shipping point, mostly at \$11, and scrap rails at about 50c. a ton more, there being a better market for rails than for heavy melting steel at the moment. Dealers are still paying \$9 to \$9.50 for machine shop turnings, but intimate that those prices will not

hold after this week. Bids for pipe have been lowered, \$11 now representing the best offer made recently, with \$10.50 perhaps the most common bid. The few chemical borings moving are being purchased at \$11, on cars. Many New England scrap piles are still buried in snow and because of prevailing prices owners are not anxious to dig material out.

The following prices are for gross-ton lots delivered consuming points:

Textile cast .....	\$19.50 to \$20.00
No. 1 machinery cast.....	19.00 to 19.50
No. 2 machinery cast.....	15.00 to 16.00
Stove plate .....	14.00 to 14.50

Railroad malleable .....

19.50 to 20.00

The following prices are offered per gross-ton lots, f.o.b. Boston rate shipping points:

No. 1 heavy melting steel.....	\$11.00 to \$11.50
No. 1 railroad wrought.....	13.00 to 13.50
No. 1 yard wrought.....	12.00 to 12.50
Wrought pipe (1 in. in diameter, over 2 ft. long).....	10.50 to 11.00
Machine shop turnings.....	9.00 to 9.50
Cast iron borings, chemical.....	11.00 to 11.25
Cast iron borings, rolling mill.....	9.00 to 9.50
Blast furnace borings and turnings .....	9.00 to 9.50
Forged scrap .....	9.50 to 10.00
Bundled skeleton, long.....	9.50 to 10.00
Forged flashings .....	9.50 to 10.00
Bundled cotton ties, long.....	8.50 to 9.00
Bundled cotton ties, short.....	9.50 to 10.00
Shafting .....	17.50 to 18.00
Street car axles.....	17.50
Rails for rerolling.....	12.00 to 12.50
Scrap rails .....	11.50 to 12.00

## St. Louis

### Sales of 6000 Tons of Pig Iron, But Demand Still Lags

ST. LOUIS, Feb. 23.—A lull in buying continues to prevail in the pig iron market. Most melters have sufficient material on hand or bought for their requirements this month and part of next, and they have not made up their minds as to second quarter needs. Some jobbing foundries report fewer orders are coming in, a fact which will have a bearing on second quarter purchases. The St. Louis Coke & Iron Corporation has sold about 6000 tons of foundry iron in five lots, most of it going to jobbing foundries. Inquiries include 600 tons of foundry iron for an Indiana stove plant, 300 to 500 tons for one Peoria melter and an unnamed tonnage for another, all for second quarter. An Illinois implement maker inquired for 200 tons and bought 100 tons. Sales by Chicago interests in this market at base prices several dollars under the ruling quotation at Chicago are still reported.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices, \$2.16 freight from Chicago, \$4.42 from Birmingham, all rail, and 81c. average switching charge from Granite City:

Northern fdy., sil. 1.75 to 2.25...	\$25.16
Northern malleable, sil. 1.75 to 2.25 .....	25.16
Basic .....	25.16
Southern fdy., sil. 1.75 to 2.25 .....	\$26.42 to 27.92
Granite City iron, sil. 1.75 to 2.25 .....	24.31 to 24.81

**Coke.**—The demand for domestic coke has eased up somewhat, largely because of the settlement of the anthracite strike. There still is a very good demand for foundry coke.

**Finished Iron and Steel.**—Business in these lines is quiet. Warehouses and manufacturing consumers of steel are buying very little, and no railroad inquiries are pending. There is little activity in the structural field, but fabricators expect considerable business to be ready for letting early in March.

For stock out of warehouse we quote: Soft steel bars, 3.15c. per lb.; iron bars, 3.15c.; structural shapes, 3.25c.; tank plates, 3.25c.; No. 10 blue annealed sheets, 3.60c.; No. 28 black sheets, cold rolled, one pass, 4.60c.; galvanized sheets, No. 28, 5.70c.; black corrugated sheets, 4.65c.; galvanized, 5.75c.; cold-rolled rounds, shafting and screw stock, 3.75c.; structural rivets, 3.65c.; boiler rivets, 3.85c.; tank rivets, 3/8-in. diameter and smaller, 70 per cent off list; machine bolts, 55 per cent; carriage bolts, 50 and 5 per cent; lag screws, 55 1/2 per cent; hot-pressed nuts, square, \$3.25 off list; hexagon, blank or tapped, \$3.75 off list.

**Old Material.**—An east side consumer has bought several thousand tons of specialties and rails from a

number of dealers, but this is the only business of consequence transacted during the last few weeks. Other grades on the list are weak, especially melting steel. A few items are lower. Railroad lists are smaller than for some time, including the St. Louis-San Francisco, 600 tons, and Missouri Pacific, 1300 tons.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

Per Gross Ton	
Iron rails	\$13.00 to \$13.50
Rails for rolling	16.25 to 16.50
Steel rails less than 3 ft.	17.00 to 17.50
Relaying rails, 60 lb. and under	24.00 to 25.00
Relaying rails, 70 lb. and over	30.00 to 31.00
Cast iron car wheels	17.25 to 17.75
Heavy melting steel	14.00 to 14.50
Heavy shoveling steel	14.00 to 14.50
Frogs, switches and guards cut apart	15.00 to 15.50
Railroad springs	17.00 to 17.50
Heavy axle and tire turnings	10.50 to 11.00
No. 1 locomotive tires	16.50 to 17.00

Per Net Ton	
Steel angle bars	13.50 to 14.00
Steel car axles	17.25 to 17.75
Iron car axles	22.50 to 23.00
Wrought iron bars and transoms	18.50 to 19.00
No. 1 railroad wrought	12.00 to 12.50
No. 2 railroad wrought	12.50 to 13.00
Cast iron borings	9.50 to 10.00
No. 1 busheling	10.00 to 10.50
No. 1 railroad cast	14.75 to 15.25
No. 1 machinery cast	16.50 to 17.00
Railroad malleable	13.50 to 14.00
Machine shop turnings	6.75 to 7.25
Bundled sheets	7.50 to 8.00

## San Francisco

### Large Structural Awards and Pending Pipe Line Jobs Feature Steady Market

SAN FRANCISCO, Feb. 19 (By Air Mail).—The awarding of 7217 tons of steel for fabrication, the setting of dates for bids on four pipe line projects which will require about 10,000 tons of plates, and the placing of 200 tons of steel with German interests for a penstock job which has been pending since late December, were the outstanding features of the past week. Slightly stronger buying interest has developed in nearly all departments of the market. While fresh inquiries are not especially large, they have been somewhat more numerous during the past week than they were in the preceding fortnight. Quotations generally remain fairly firm.

**Pig Iron.**—Current buying is confined to small lots of both domestic and imported irons. Most of the local foundries have covered their requirements and are not expected to be in the market for any large tonnages for the remainder of the present quarter. Prices are unchanged.

*Utah basic	\$27.00 to \$28.00
*Utah foundry, sil. 2.75 to 3.25	27.00 to 28.00
**English foundry, sil. 2.75 to 3.25	25.00 to 26.00
**Belgian foundry, sil. 2.75 to 3.25	24.00
**Dutch foundry, sil. 2.75 to 3.25	24.00
**Indian foundry, sil. 2.75 to 3.25	24.00 to 25.00
**German foundry, sil. 2.75 to 3.25	24.00
**Chinese foundry, sil. 3 to 3.50	25.50

\*Delivered San Francisco.

\*\*Duty paid, f.o.b. cars San Francisco.

**Shapes.**—Lettings during the past week total 7217 tons, which represents the largest amount awarded for fabrication in any single week so far this year. The largest individual job, the Hunter-Dulin Building, San Francisco, calls for 4500 tons, which has been awarded to the United States Steel Products Co. Fresh inquiries total about 400 tons. Bids have been rejected on the San Leandro Junior High School, Oakland, Cal., calling for 250 tons. It will be readvertised in the near future. A moderate-size tonnage is understood to have been placed during the week at less than 2.35c., c.i.f. Coast ports, the prevailing Eastern mill quotation, but confirmation is lacking.

**Plates.**—The Marin Municipal Water District, San Rafael, Cal., will close bids March 16 on 1500 tons of plates for seven miles of welded steel pipe. The Water Commission, Medford, Ore., will close bids March 9 on

2500 to 3000 tons of plates for 30 miles of pipe line, and the city of San Diego, Cal., will call for bids about March 22 on approximately 5000 tons of plates and 25,000 tons of cast iron pipe for 25 miles of pipe line between that city and the proposed El Capitan dam site. The San Joaquin Light & Power Co., Fresno, Cal., has placed 200 tons of steel for a penstock job with the Ferrum Co. of Czechoslovakia. This is the remainder of the material required, the bulk of which (1500 tons) was awarded to the Ferrum Co. last December, as reported in the Jan. 7 issue of THE IRON AGE, page 85. The Willamette Steel Pipe Co. has been awarded 2300 tons of lock-bar pipe by the city of Portland, Ore., and the city of Tampa, Fla., has placed 100 tons of dredge pipe with the Pacific Coast Engineering Co., Oakland, Cal. Eastern mill quotations continue firm at 2.30c., c.i.f. Coast ports.

**Bars.**—Local reinforcing bar jobbers continue to quote as follows: 2.80c., base, per lb. on lots of 300 tons; 2.95c., base on carload lots, and 3.20c., base on less-than-carload lots. Only one job calling for more than 100 tons is known to have been closed during the week, i.e., 268 tons for the Womans' Club, San Francisco, awarded to Truscon Steel Co. An unnamed inquiry for 700 tons for export to the Hawaiian Islands is in the market, and two fresh inquiries for local buildings, one for 200 tons and the other for 1000 tons, have come up for figures this week.

**Cast Iron Pipe.**—The city of Portland, Ore., is expected to be in the market in the near future for about 5800 tons of cast iron water pipe. The city of Bellingham, Wash., is taking bids on 733 tons, and the city of Glendale, Cal., will close bids March 2 on about 200 tons. The city of Eureka, Cal., has placed 100 tons with the American Cast Iron Pipe Co. The city of Spokane, Wash., has placed 400 tons with the United States Cast Iron Pipe & Foundry Co., and the city of Oswego, Ore., has awarded 480 tons to the Oregon Iron & Steel Co., Portland. Prices are unchanged at \$50 to \$52 base, water shipment, San Francisco.

**Steel Pipe.**—The Associated Oil Co., San Francisco, has placed 36 tons of 8-in. line pipe with an Eastern mill, and is asking for bids on 210 tons of 8-in. line pipe. The city of Los Angeles, Cal., has placed 100 tons of galvanized pipe under Specification W-599, with the Associated Supply Co., Los Angeles.

**Warehouse Business.**—Buying has been somewhat stronger during the past week, but specifications are mostly for small quantities. Prices are unchanged, although 2.40c., base Pittsburgh, is understood to have been quoted to a local user of cold rolled shafting during the past week.

Local warehouse prices, per 100 lb., are as follows: Merchant bars, \$3.30 base; merchant bars,  $\frac{3}{4}$  in. and under, rounds, squares and flats, \$3.80 base; soft steel bands, \$4.15 base; angles,  $\frac{3}{4}$  in. and larger x  $1\frac{1}{2}$  in. to  $2\frac{1}{2}$  in., incl., \$3.30 base; channels and tees,  $\frac{3}{4}$  in. to  $2\frac{1}{2}$  in., incl., \$3.90 base; angles, beams and channels, 3 in. and larger, \$3.30 base; tees, 3 in. and larger, \$3.30 base; universal mill plates,  $\frac{1}{4}$  in. and heavier, stock lengths, \$3.30 base; spring steel,  $\frac{1}{4}$  in. and thicker, \$6.30 base; wire nails, \$3.50 base; cement coated nails, \$3 base; No. 10 blue annealed sheets, \$3.75; No. 28 galvanized sheets, \$6; No. 28 black sheets, \$4.75.

**Ferroalloys.**—A local importer has recently taken orders for several carloads of 80 per cent English ferromanganese which is quoted \$117.50, duty paid, San Francisco. Swedish 50 per cent ferrosilicon is quoted at \$95, duty paid, San Francisco.

**Coke.**—No buying of volume is being done. Inquiries are mostly for small lots. Importers continue to quote as follows:

English beehive, \$15 to \$16 per ton at incoming dock, and English by-product, \$12 to \$14; German by-product, \$11.50 to \$12.

The General Electric Co. has designed and is now marketing a new line of synchronous motors for general purpose application. The ratings range from 20 to 150 hp. with speeds of 1200, 900, 720 and 600 r.p.m. at 60 cycles.

## New York

### Large Pig Iron Inquiries—60,000 Tons of Line Pipe in the Market

NEW YORK, Feb. 23.—The appearance of close to 10,000 tons in fresh pig iron inquiries, largely for second quarter delivery, reflects a disposition on the part of melters to sound out the market even if they are not yet ready to place actual orders. The Central Foundry Co., New York, is in the market for 4400 tons of foundry iron for second quarter delivery to its various plants, and the Essex Foundry, Newark, N. J., is inquiring for 2000 to 2500 tons of foundry for shipment during the same period. E. & T. Fairbanks & Co., St. Johnsbury, Vt., is asking for prices on 1000 tons of No. 2X foundry for second quarter, and a New York State melter wants 800 tons of iron for the same delivery. A Connecticut user is inquiring for 500 tons for March and April shipment. Sales by local selling houses during the past week consisted largely of scattered small lots and did not aggregate more than 5000 tons. Prices on domestic iron remain unchanged, although they are largely untested. Foreign iron is stronger for forward delivery, but accumulations now on Eastern seaboard are being pressed for sale at low prices, frequently at losses to importers. No. 1X Continental foundry is available at \$21, duty paid port of entry, while Indian is bringing as high as \$22, base.

We quote per gross ton delivered in the New York district as follows, having added to furnace prices \$2.52 freight from eastern Pennsylvania, \$4.91 from Buffalo and \$5.54 from Virginia:

East. Pa. No. 2 fdy., sil. 1.75 to 2.25	\$24.52 to \$25.02
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	25.02 to 25.52
East. Pa. No. 1X fdy., sil. 2.75 to 3.25	25.52 to 26.02
Buffalo fdy., sil. 1.75 to 2.25	25.91
No. 2 Virginia fdy., sil. 1.75 to 2.25	29.54

**Ferroalloys.**—Only carload and small lots, both of ferromanganese and spiegeleisen, is the general report from all sellers as to the activity in the market. There is a dearth of large inquiry, but specifications on contract are satisfactory and prices are apparently unchanged. There is very little new business in 50 per cent ferrosilicon or standard ferrochromium, but consumers are active in requesting shipments on contract.

**Finished Iron and Steel.**—Indications are that specifications on contracts plus new business are sufficient to bring demand against the mills to within 10 per cent of the volume in January. Reports from the mills indicate a surprisingly high rate of production, and in spite of the heavy shipments, the reduction in the backlog of unfilled orders is not much greater than 7 or 8 per cent. Severe weather has been a large factor in checking buying and has also affected deliveries adversely, particularly among the jobbers, who are considerably behind in this respect. The betterment in the oil country demand is reflected in this market where there are inquiries from three companies for between 60,000 and 70,000 tons of line pipe for oil and gas. The situation summed up is that sellers are clearly waiting for the next period of buying with the coming of spring, and are rather generally holding prices firmly. In the structural field the new basis now coming in of figuring on the completed detailed plans of a building is responsible for some let down in fabricated steel awards. In plates, 2.09c. New York, has not disappeared but is less frequently heard and 2.14c. is the general first quarter price.

We quote for mill shipments, New York delivery, as follows: Soft steel bars, 2.34c. to 2.44c. per lb.; plates, 2.09c. to 2.14c.; structural shapes, 2.24c. to 2.34c.; bar iron, 2.24c.

**Warehouse Business.**—Black and galvanized sheets are being rather successfully maintained at 4.50c. for the former and 5.50c. per lb., base for the latter, but as current purchases are confined to small lots there is as yet no genuine test of the strength of these prices as a minimum. Bars and shapes show some weakness

and on desirable business concessions of \$1 to \$2 per ton are evidently obtainable. Recent weather conditions have been an unfavorable factor, interfering considerably with deliveries. However, as the mills have been encountering this same difficulty, jobbers expect increased business during March as a result of consumers' needs of material for immediate use. Prices on page 612. We quote boiler tubes per 100 ft. as follows:

Lap welded steel tubes, 2-in., \$17.33; seamless steel, 2-in., \$20.24; charcoal iron, 2-in., \$25; 4-in., \$67.

**Cast Iron Pipe.**—Municipal inquiries for water pipe are providing considerable activity and prices are showing slightly more firmness, although there have been no actual advances reported. The Department of Purchase, New York, will open bids March 5 on about 3000 tons of water pipe, fittings and fire hydrants. The low bidder on the 2500 tons of 6-in. to 36-in. pipe for Rochester, N. Y., was B. Nicoll & Co., New York, quoting on French pipe. The United States Cast Iron Pipe & Foundry Co. is understood to have been low bidder on the 1800 tons of pipe for Buffalo and the 500 tons of 6 to 20-in. pipe for Schenectady, N. Y. Bids have been opened by Baltimore and Washington, on 2500 tons of pipe in each case. Medford, Mass., which opened bids recently on several hundred tons of water pipe has rejected all bids and will reissue the inquiry. The small tonnage of pipe for which Quincy, Mass., has been in the market is understood to have gone to the Donaldson Iron Co. Saugerties, N. Y., has not yet closed on the 2000 to 3000 tons of pipe on which bids have been taken. Soil pipe continues quiet with practically all makers on the higher schedule that was recently adopted.

We quote pressure pipe per net ton, f.o.b. New York, in carload lots, as follows: 6-in. and larger, \$50.60 to \$52.60; 4-in. and 5-in., \$55.60 to \$57.60; 3-in., \$65.60 to \$67.60; with \$5 additional for Class A and gas pipe. Discounts both of Northern and of Southern makers of soil pipe, f.o.b. New York, are as follows: 6-in., 40 to 40 1/2 per cent off list; heavy, 50 to 50 1/2 per cent off list.

**Old Material.**—Prices on practically all grades are unchanged and the undertone of weakness continues. While brokers are still paying \$14 per ton, delivered on a \$2.65 per ton freight rate for borings and turnings, in several instances this price is only being offered on tonnages shipped before the end of this month. Heavy breakable cast is being bought at about \$16.50 per ton, delivered eastern Pennsylvania steel mills with \$17.50 per ton still the buying price for a consumer with a \$2.90 freight rate from New York. Continued bad weather is not permitting the shipment of much scrap from New England yards and the current buying prices are not much of an inducement to hasten in shipments. No. 1 heavy melting steel continues at \$15.50 to \$16 per ton, delivered, but recent efforts of consumers to buy on this basis have not met with much success, as brokers are unwilling to commit themselves for any substantial tonnage at the present level of the market.

Buying prices per gross ton, New York, follow:	
Heavy melting steel (yard).....	\$11.00 to \$11.50
Heavy melting steel (railroad or equivalent) .....	12.50 to 13.00
Rails for rolling.....	13.00 to 13.50
Relaying rails, nominal.....	23.00 to 24.00
Steel car axles.....	19.50 to 20.00
Iron car axles.....	23.50 to 24.00
No. 1 railroad wrought.....	14.00 to 14.50
Forge fire.....	10.50 to 11.00
No. 1 yard wrought, long.....	13.00 to 13.50
Cast borings (steel mill).....	10.00 to 10.25
Cast borings (chemical).....	14.00 to 14.50
Machine shop turnings.....	10.00 to 10.25
Mixed borings and turnings.....	10.00 to 11.00
Iron and steel pipe (1 in. diam., not under 2 ft. long).....	11.75 to 12.25
Stove plate (steel mill).....	10.00 to 10.50
Stove plate (foundry).....	11.25 to 11.75
Locomotive grate bars.....	11.25 to 11.75
Malleable cast (railroad).....	16.50 to 17.50
Cast iron car wheels.....	13.50 to 14.00
No. 1 heavy breakable cast.....	12.75 to 14.50

Prices which dealers in New York and Brooklyn are quoting to local foundries per gross ton follow:

No. 1 machinery cast.....	\$17.50 to \$18.00
No. 1 heavy cast (columns, building material, etc.), cupola size	16.00 to 16.50
No. 2 cast (radiators, cast boilers, etc.) .....	15.00 to 15.50

**Coke.**—The recent rapid decline of the coke market to a more normal level is bringing out some inquiry from furnace and foundry consumers, who had previously refrained from purchasing. Foundry is quoted at \$6 to \$6.50 per ton with occasional sales at \$7. By-product is unchanged at \$11.52 per ton, delivered Newark or Jersey City, N. J.

## Cleveland

### Effort to Stiffen Prices, Especially on Sheets—Large Ore Boat Inquiry

CLEVELAND, Feb. 23.—Leading producers are making a determined effort to stiffen prices, and the market shows a firmer tone on steel bars, plates and structural material, as well as on sheets. While steel bars have been generally held at 2c., base Pittsburgh, in this territory, some of the mills are now quoting that price only for round lots and are endeavoring to get \$2 a ton higher for small orders, this being a renewal of efforts that were made in that direction several weeks ago. Plates are stronger than for some time. While 1.80c., base Pittsburgh, has not disappeared, some of the mills that have been meeting that price are now on a 1.90c. basis and have made sales at the higher price. Efforts are being made to place structural material firmly on a 2c. basis.

In the firmer price stand taken by some of the producers is seen an attempt to place steel bars, plates and structural shapes on a 2c. basis for the second quarter. From the standpoint of demand, the market shows little change. Mills are getting a fair volume of specifications, but not much new business is coming out. That consumers are still carrying low stocks is indicated by pressure for early shipment from buyers of small lots. The demand for steel from the automotive industry seems to be gaining, and makers of alloy steel are now comfortably filled with business. The building outlook is regarded as promising, although inquiry is slow in coming out. A leading steel interest has asked for prices on two ore boats, requiring 10,000 tons of steel. This is the first inquiry that has appeared for large Lake freighters for delivery this year.

**Pig Iron.**—The market is still dragging, although it has become somewhat more active in Michigan, where several lots of from 500 to 1000 tons were sold during the week. There is also some activity in Erie, Pa., but virtually no buyers in the northern Ohio territory. Two Cleveland interests sold 10,000 tons during the week. There is no change in the price situation beyond the recent 50c. decline to \$22.50, furnace, in Michigan, western Ohio and eastern Indiana, and the market has not yet been put to a real price test since the ending of the anthracite strike, which caused some consumers to look for low prices. Valley producers continue to quote foundry and malleable iron at \$20.50, furnace, which is also the Cleveland price at furnace for outside shipment. For Cleveland delivery local producers hold to \$22 at furnace. Most makers report a heavy volume of shipping orders. The McKinney Steel Co., which recently blew out two furnaces in Cleveland, banked a stack during the week, leaving only one in blast.

Quotations below, except on basic and low phosphorus iron, are delivered Cleveland, and for local iron include a 50c. switching charge. Ohio silvery and Southern iron prices are based on a \$3.02 freight rate from Jackson and \$6.01 from Birmingham:

Basic, Valley furnace	20.00
N'th'n No. 2 fdy., sil. 1.75 to 2.25	22.26 to 22.50
Southern fdy., sil. 1.75 to 2.25	28.01
Malleable	22.26 to 22.50
Ohio silvery, 8 per cent	33.52
Standard low phos., Valley furnace	27.50 to 28.00

**Iron Ore.**—The consumption of Lake Superior iron ore during January amounted to 5,042,792 tons, an increase of 78,277 tons over December. The amount consumed in January, 1925, was 5,241,992 tons. The amount of ore on hand at furnaces Feb. 1 was 25,412,086 tons and the total amount at furnaces and Lake

Erie docks on the same date was 32,034,619 tons as compared with 31,153,594 tons on the same date a year ago. Furnaces in the central district consumed 2,777,469 tons in January, a gain of 46,994 tons over December. Eastern furnaces consumed 126,796 tons, a gain of 3319 tons and Lake front furnaces consumed 2,030,200 tons, an increase of 36,473 tons for the month. All rail furnaces consumed 108,327 tons, a decrease of 8509 tons. On Jan. 31 there were 186 furnaces in blast using Lake ores, a decrease of eight for the month.

**Ore Shipments.**—All-rail shipments of Lake Superior ore during 1925 were 1,436,320 tons, making a total movement for the year 55,534,812 tons, according to figures just tabulated by the Lake Superior Iron Ore Association.

**Semi-Finished Steel.**—Specifications are light, and no inquiry has come out for second quarter contracts. Producers expect that the present prices of \$36, Youngstown, for sheet bars and small billets, and \$35 for large billets and slabs, will be maintained for that delivery.

**Sheets.**—Most sheet makers have taken a firmer attitude on prices, and several of the larger producers are declining to shade 3.35c., base Pittsburgh, on black, 2.50c. on blue annealed, and 4.60c. on galvanized, and some of the mills are ready to quote these prices for the second quarter. While blue annealed sheets now appear firm at the above price, concessions of \$2 a ton are still being made on black and galvanized sheets. Little business has been booked at the higher prices. Consumers are showing considerable resistance to higher prices, and the test of the market is yet to come. No attempt is being made to advance automobile body sheets, which are quoted at 4.40c. The volume of sheet business shows improvement in releases on contracts, but there is not much new business.

**Bolts, Nuts and Rivets.**—The demand for bolts and nuts is fairly good, but there is little new buying, as orders are nearly all in specifications on contracts. Rivets are rather quiet. Although price concessions on large rivets are reported in Pittsburgh territory, the leading local maker is holding to \$2.60 per 100 lb.

**Strip Steel.**—An Ohio mill has opened its books for hot and cold-rolled strip steel for the second quarter at the prices now prevailing, and has taken some business for that delivery. Orders are rather slow, the demand from the automotive industry for strips not being so active as for sheets.

**Reinforcing Bars.**—The Walsh Construction Co. has taken a general contract for a sewage disposal plant for Akron, Ohio, requiring 2000 tons of reinforcing bars. New inquiries are light and prices are unchanged.

**Warehouse Business.**—The volume of business is quite heavy, and prices on most items are firmer, although there is still some irregularity in sheets.

Jobbers quote steel bars, 3.10c. per lb.; plates and structural shapes, 3.20c.; No. 28 black sheets, 4.10c.; No. 28 galvanized sheets, 5.25c.; No. 10 blue annealed sheets, 3.25c.; cold-rolled rounds and hexagons, 3.90c.; flats and squares, 4.40c.; hoops and bands, 3.85c.; No. 9 annealed wire, \$3 per 100 lb.; No. 9 galvanized wire, \$3.45 per 100 lb.; common wire nails, \$3 base per keg.

**Coke.**—Connellsville foundry coke has declined to \$5.50 to \$6.50 ovens, for the better grades, but consumers are buying only when necessary as they do not think that the price readjustment following the anthracite strike is yet complete. Connellsville foundry coke prices are now down to a point which will probably allow very little Virginia or West Virginia foundry coke to come into this market. Connellsville heating coke is now quoted at \$4.50 to \$5, ovens.

Ohio by-product furnace coke for domestic use has declined further to a range of \$7.50 to \$8. The February price of \$8.50 at oven for Painesville by-product foundry coke has been reaffirmed for March.

**Old Material.**—Considerable scrap is backing up because production is in excess of the demand. Yards have become filled with material which dealers have put in stock because of the holding up of shipments by mills, although a limited portion of the increase of stocks is

evidently due to speculative buying by dealers. Machine shop turnings are very weak and about 75c. a ton lower, since there is no market locally for this grade and dealers are finding a limited outlet in the Youngstown and Pittsburgh districts. Sales of borings and turnings for Canton shipment are reported at \$13.25, delivered. Compressed sheet steel has also declined, and the whole market is weak. A local mill recently bought heavy melting steel at \$16 delivered, but is now refusing offers for this material at that price.

We quote dealers' prices f.o.b. Cleveland per gross ton:

Heavy melting steel.....	\$15.25 to \$15.75
Rails for rolling.....	16.75 to 17.00
Rails under 3 ft.....	19.00 to 19.50
Low phosphorus melting.....	17.75 to 18.25
Cast iron borings.....	12.25 to 12.50
Machine shop turnings.....	11.50 to 12.00
Mixed borings and short turnings.....	12.25 to 12.50
Compressed sheet steel.....	13.75 to 14.00
Railroad wrought.....	13.75 to 14.25
Railroad malleable.....	20.00 to 20.50
Light bundled sheet stampings.....	12.25 to 12.50
Steel axle turnings.....	14.50 to 14.75
No. 1 cast.....	17.50 to 18.00
No. 1 busheling.....	12.25 to 12.50
Drop forge flashings.....	13.25 to 13.50
Railroad grate bars.....	13.25 to 13.50
Stove plate.....	13.25 to 13.50
Pipes and flues.....	11.50 to 12.00

## Birmingham

### Plates Decline But Steel Output Is Heavy —Pig Iron Demand Better

BIRMINGHAM, Feb. 23.—The probable output of foundry as well as basic pig iron during the second quarter will be fully needed, according to present indications, since sales are in encouraging volume and many inquiries in hand. In fact, it is estimated that one-third of Alabama production for the quarter is already obligated. What little surplus iron is on the yards will be needed for spot business, which lately has shown signs of revival. Consumers in the South apparently are confident that their plants will remain active for some time to come. Moreover, it is intimated that the next buying movement, which seems imminent, will cover deliveries into the third quarter of the year. The Tennessee Coal, Iron & Railroad Co. has one furnace on foundry iron, the Sloss-Sheffield Steel & Iron Co. six, the Woodward Iron Co. five, and the Republic Iron & Steel Co. two. This schedule promises to continue, with a possibility of the Holt furnace of the Central Iron & Coal Co. being repaired and blown in next month. Various interests report better feeling and this is reflected in improved inquiry for pig iron. Eighty-five per cent of the Southern make of iron is consumed in the South, and there are several projects under construction or consideration which will increase the melt.

We quote per gross ton, f.o.b. Birmingham district furnaces, as follows:

No. 2 foundry, 1.75 to 2.25 sil...	\$22.00
No. 1 foundry, 2.25 to 2.75 sil...	22.50
Basic.....	22.00
Charcoal, warm blast.....	\$30.00 to 32.00

**Rolled Steel.**—Railroads have been placing additional orders for various forms of steel, and business from other sources has been steady. The St. Louis-San Francisco has placed 750 underframes with the Tennessee Coal, Iron & Railroad Co., besides 500 cars ordered from that company a few weeks ago. The rail schedules of the Ensley plant are large. Fabricating plants report fairly good demand, and business in wire and nails has improved. Practically all of the open-hearth furnaces of the district are producing. Soft steel bars are quoted at 2.15c. to 2.25c., base Birmingham; and structural shapes at 2.05c. to 2.15c. Plates have declined, now ranging from 1.95c. to 2.05c.

**Cast Iron Pipe.**—Tonnage for first quarter delivery is keeping plants busy, and second quarter business is coming in at a satisfactory rate. Quotations are firmer. Concessions during the first quarter brought prices

down to \$41, for 6-in. and larger pipe, but \$1 a ton higher is being asked for the second quarter. Several lettings of large proportions are in sight.

**Coke.**—The effect of the settlement of the anthracite strike is commencing to be felt. Birmingham has been shipping some coke into Buffalo and Ontario. This will cease, but nut coke deliveries to Detroit and Chicago will continue for a while at least. Coke quotations, however, still range from \$5.75 to \$6, ovens.

**Old Material.**—The market remains weak, but prices are nominally unchanged. Dealers are still rushing deliveries on old contracts, but little new business has been coming in.

We quote per gross ton, f.o.b. Birmingham district yards, as follows:

Cast iron borings, chemical.....	\$15.00 to \$16.00
Heavy melting steel.....	14.00 to 14.50
Railroad wrought.....	13.00 to 13.50
Steel axles.....	19.00 to 20.00
Iron axles.....	18.00 to 19.00
Steel rails.....	14.00 to 14.50
No. 1 cast.....	17.00 to 17.50
Tramcar wheels.....	17.00 to 17.50
Car wheels.....	16.00 to 16.50
Stove plate.....	14.00 to 14.50
Machine shop turnings.....	8.00 to 8.50
Cast iron borings.....	8.00 to 8.50
Rails for rolling.....	17.50 to 18.00

## Buffalo

### Heavy Pig Iron Specifications but Buying Light—Melting Scrap Down 50c

BUFFALO, Feb. 23.—The pig iron market is steady at \$21, base furnace, but new business is almost at a standstill so far as sizable tonnages are concerned. Producers, however, are shipping very freely on old orders, and one local maker reports the heaviest specifications of any week in its history.

Two or three inquiries of size were before the market early in the week, but these were withdrawn. Furnace men believe that from 75 to 80 per cent of the foundries have not covered for the second quarter, and they expect a buying movement. Full silicon differentials are being asked above the base price of \$21. One furnace is quoting \$22, base, on second quarter delivery.

We quote prices per gross ton, f.o.b. Buffalo, as follows:

No. 2 plain fdry., sil. 1.75 to 2.25	\$21.00
No. 2X foundry, sil. 2.25 to 2.75.....	21.50
No. 1 foundry, sil. 2.75 to 3.25.....	22.50
Malleable, sil. up to 2.25.....	21.00
Basic.....	\$20.50 to 21.00
Lake Superior charcoal.....	29.28

**Finished Iron and Steel.**—Most mills report a satisfactory volume of orders, but a slight decrease in inquiry. There is no basic change to the market. Specifications are coming in freely. Bars are still quotable at 2.25c., Buffalo, shapes at 2.16c. and plates at 2.06c. There has been a slight slackening in the buying of full-finished sheets. A number of small fabricated jobs have been placed but nothing sizable. Two reinforcing jobs are up for bids: 175 tons for a Buffalo garbage incinerator and 150 tons for a filtration plant at Dunkirk, N. Y. Semi-finished steel prices are holding, with billets at \$35, Pittsburgh, and sheet bars at \$36, Pittsburgh.

Warehouse prices are being quoted as follows: Steel bars, 3.30c. per lb.; steel shapes, 3.40c.; steel plates, 3.40c.; No. 10 blue annealed sheets, 3.90c.; No. 28 black sheets, 4.60c.; No. 28 galvanized, 5.75c.; cold-rolled shapes, 4.45c.; cold-rolled rounds, 3.95c.; wire nails, 3.90c.; black wire, 3.90c.

**Old Material.**—One local mill will pay \$15.50 for heavy melting steel, but this is the only market for that grade in the territory. Stove plate is firm at \$15, which is being offered by a Buffalo consumer which recently bought approximately 3000 tons. Stove plate is scarce. There are a few small sales of scrap among dealers, but general demand is off. On orders about to expire dealers have had to pay a little more than the

market. Dealers' stocks are depleted and production of scrap is not heavy.

We quote prices per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel.....	\$15.50
Low phosphorus.....	19.50 to 20.00
No. 1 railroad wrought.....	14.00 to 14.50
Car wheels.....	17.00 to 17.50
Machine shop turnings.....	11.50 to 12.00
Mixed borings and turnings.....	12.50 to 13.50
Cast iron borings.....	12.50 to 13.50
No. 1 bushelling.....	15.50 to 16.00
Stove plate.....	14.50 to 15.00
Grate bars.....	13.00 to 13.50
Hand-bundled sheets.....	11.00 to 11.50
Hydraulic compressed.....	15.00 to 15.50
No. 1 machinery cast.....	16.50 to 17.00
Railroad malleable.....	18.50 to 19.00
No. 1 cast scrap.....	17.00 to 17.50
Iron axles.....	25.00 to 26.00
Steel axles.....	17.50 to 18.00

## Philadelphia

### Steel Business Shows No Marked Improvement—Pig Iron Off 50c.

PHILADELPHIA, Feb. 23.—Small sales of foundry pig iron for second quarter have established a price 50c. a ton below that which has prevailed on recent sales for prompt shipment. Inquiries for second quarter totaling several thousand tons now in the market will afford a further test of prices.

The general trend of the iron, steel and scrap markets is toward weakness, although in the case of steel the tendency is not much in evidence. It is significant, however, that the volume of steel buying has not increased, except in the case of plates, and there is a suggestion of lower prices on some commodities for second quarter in the report that at least one mill has offered bar contracts for that period at 1.90c., Pittsburgh, \$2 a ton below the prevailing quotation. There are intimations that building construction and railroad rolling stock requirements will take larger tonnages of steel in March than has been forthcoming in the first two months of this year. Structural steel lettings are few in number and involve very small tonnages, and railroad buying has been below expectations.

**Iron Ore.**—An Eastern steel company is negotiating for foreign iron ore up to 250,000 tons. Swedish ore is now quoted at about 9c. per unit, Philadelphia, while some North African ores are obtainable at about 8c. to 8.50c. per unit.

**Ferroalloys.**—There is no demand worth noting for ferromanganese, but the price on both domestic and foreign alloy remains firm at \$115, furnace or seaboard.

**Pig Iron.**—Bearing out buyers' expectations, eastern Pennsylvania pig iron prices have declined slightly on small sales for second quarter. Although iron for prompt shipment was sold within the week at \$23, furnace, there were coincident sales of small lots for second quarter at \$22.50, and inquiries now in the market aggregating several thousand tons are counted upon to bring a more definite indication as to what iron producers may be willing to do for second quarter backlog. With the furnace coke price at \$3.75, and with indications that firm offers of \$3.50 would not be refused, there was hope today that coke for second quarter might decline to \$3, and if such should prove to be the case, there would be a saving of from \$1.50 to \$1.75 per ton of iron as compared with the first quarter coke cost. Opinion in the pig iron market is that most or all of this saving will be passed along to the consumer. The Central Foundry Co. has inquired for 1800 tons of No. 2 plain and No. 2X iron for its Baltimore plant and 600 tons of the same grades for its Lansdale, Pa., plant for second quarter. The Essex Foundry Co., Newark, N. J., whose usual requirements for three months are about 2500 tons, has also asked for second quarter prices. These, with some other inquiries from the New

England and New York districts, point to the probability that the second quarter price situation will have become clarified within the next two weeks.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia and include freight rates varying from 75c. to \$1.63 per gross ton:
East. Pa. No. 2 plain, 1.75 to 2.25 sil. .... \$23.26 to \$24.13
East. Pa. No. 2X, 2.25 to 2.75 sil. .... 23.76 to 24.63
East. Pa. No. 1X, 2.25 sil. .... 24.26 to 25.13
Virginia No. 2 plain, 1.75 to 2.25 sil. .... 27.67 to 28.67
Virginia No. 2X, 2.25 to 2.75 sil. .... 28.17 to 29.17
Basic, delivered eastern Pa. .... 23.00 to 23.50
Gray forge .... 23.00 to 23.50
Malleable .... 23.50 to 24.00
Standard low phos. (f.o.b. furnace) .... 23.00 to 24.00
Copper bearing low phos. (f.o.b. furnace) .... 24.00

**Billets.**—Small sales of billets are being made at \$35, Pittsburgh, for open-hearth rerolling quality and at \$40, Pittsburgh, for forging, although in some cases mills quote 50c. or \$1 higher.

**Plates.**—Almost without exception, Eastern plate mills report a decidedly better demand within the past week, this being a mark of improvement which applies, for some reason, particularly to plates, as there has been no important change one way or the other in the demand for other hot-rolled products. The plate market remains quite firm at 1.80c., Pittsburgh, the bulk of the orders being of such small size as to afford no severe test of the price. The larger buyers are covered on contract for the quarter.

**Structural Material.**—Although there is a fairly good number of small orders for structural shapes, large tonnages are conspicuously few. Some mills are finding places in their rolling schedules which permit much quicker rollings and shipments than were to be had a month or so ago. The price situation in the Philadelphia district is unchanged. Small lots range from 1.85c. to 1.90c., Pittsburgh, while large lots, when there are any, are obtainable from some mills at not above 1.80c., Pittsburgh. It is Eastern mills rather than Pittsburgh mills, however, which are making the lowest prices.

**Bars.**—Some of the makers of bars are trying to run down reports received from buyers that 1.90c., Pittsburgh, has been quoted on second quarter contracts. The price for prompt shipment, which means two to four weeks, depending on mill conditions and the character of the rolling, remains firm at 2c., Pittsburgh. The order for 1200 tons of concrete reinforcing bars for two Philadelphia school buildings has been switched from one importer to another. After the award had tentatively been made to one importer by the William Cramp & Sons Ship & Engine Building Co., the general contractor, it was given to another importer who quoted a lower price, said to be below 1.80c., delivered Philadelphia, duty paid. Bar iron is still quoted by Eastern mills at 2.22c., Philadelphia.

**Warehouse Business.**—Price cutting on steel products out of stock has to some extent disappeared from the Philadelphia market. The prices given below, which are for local delivery only, represent what most of the jobbers are quoting:

Soft steel bars and small shapes, 2.90c. to 3.20c. per lb.; iron bars (except bands), 2.90c. to 3.20c.; round edge iron, 3.50c.; round edge steel, iron finished, 1 1/2 x 1/2 in., 3.50c.; round edge steel, planished, 4.30c.; tank steel plates, 1/4-in. and heavier, 2.80c. to 3c.; tank steel plates, 1/8-in., 3c.; blue annealed steel sheets, No. 10 gage, 3.50c.; black sheets, No. 28 gage, 4.65c.; galvanized sheets, No. 28 gage, 5.85c.; square, twisted and deformed steel bars, 3c.; structural shapes, 2.75c. to 2.90c.; diamond pattern plates, 1/4-in., 5.30c.; 1/8-in., 5.50c.; spring steel, 5c.; rounds and hexagons, cold-rolled steel, 4.50c.; steel hoops, 4c. to 4.25c., base; steel bands, No. 12 gage to 1/2-in., inclusive, 3.75c. to 3.90c.; rails, 3.20c.; tool steel, 8.50c.; Norway iron, 6.50c.

**Sheets.**—In the opinion of some sellers of sheets the price situation is less weak than it was a fortnight ago. However, there are still reports of quotations of 3.25c. on black sheets and 4.50c., Pittsburgh, on gal-

vanized sheets. On blue annealed there were a few quotations of 2.40c., Pittsburgh, but the price is said now to be firmer at 2.50c.

**Imports.**—Pig iron imports at Philadelphia last week again took an upward jump, with a total of 11,278 tons, of which 7350 tons came from England, 1936 tons from France and 1992 tons from India. Detailed figures on 1925 pig iron imports which have been received by pig iron producers in this district from the Department of Commerce show that 47 per cent of last year's total importation of 441,000 tons came in at Philadelphia, and India was by far the largest supplier. Other imports last week were: Chrome ore from Greece, 1430 tons; chrome ore from British India, 1000 tons; galvanized steel strips from England, 12 tons; other steel strips from England, 4 tons.

**Old Material.**—Eastern mills continue to remain indifferent to the scrap market so far as actual purchases are concerned. The only market activity is purchases by brokers against old contracts and even these are being made in a leisurely fashion, indicating that the scrap trade itself expects no immediate change in the market trend. For heavy melting steel the best prices obtainable are \$15.50 for delivery at Bethlehem, Pa., and \$16 for delivery at one or two other points. A small sale to a mill was made at \$16.25. Blast furnace borings and turnings, heavy breakable cast, shafting and steel axles are all lower by 50c. to \$1 a ton.

We quote for delivery, consuming points in this district, as follows:

No. 1 heavy melting steel	\$15.50 to \$16.00
Scrap rails	15.50 to 16.00
Steel rails for rolling	17.00 to 17.50
No. 1 low phosph. heavy, 0.04 per cent and under	20.00 to 21.00
Couplers and knuckles	19.00 to 20.00
Rolled steel wheels	19.00 to 20.00
Cast iron car wheels	17.50 to 18.00
No. 1 railroad wrought	17.50 to 18.00
No. 1 yard wrought	16.50 to 17.00
No. 1 forge fire	14.50 to 15.00
Bundled sheets (for steel works)	13.50
Mixed borings and turnings (for blast furnace)	13.00 to 13.50
Machine shop turnings (for steel works)	13.50
Machine shop turnings (for rolling mill)	14.00
Heavy axle turnings (or equivalent)	15.00
Cast borings (for steel works and rolling mill)	14.00
Cast borings (for chemical plant)	15.50 to 16.00
No. 1 cast	17.50 to 18.00
Heavy breakable cast (for steel works)	16.00 to 16.50
Railroad grate bars	14.50
Stove plate (for steel works)	14.50
Wrought iron and soft steel pipes and tubes (new specifications)	15.50 to 16.00
Shafting	21.00 to 22.00
Steel axles	21.00 to 22.00

### By-Product Coke Output Highest Ever Recorded

**WASHINGTON,** Feb. 23.—Production of by-product coke during January, as reported by operators to the Bureau of Mines, amounted to 3,804,000 net tons, an increase of 11.7 per cent, compared with the preceding month. The daily output increased in January to 122,711 tons, a gain of 1406 tons or 1.1 per cent, compared with the December rate. The coke plants operated at about 92 per cent of capacity. The total number of by-product plants now in existence is 80, of which 74 were active during January. The report says the current output remains the highest on record for any month.

Beehive coke production continued to increase in January, due to demand for household fuel previous to settlement of the anthracite coal strike. The output of this coke for the month was estimated at 1,381,000 net tons, an increase of 74,000 tons, or 5.7 per cent, compared with December. Production of beehive coke during the week ended Feb. 13, as indicated by reports of loadings on the principal coke carriers, amounted to 357,000 net tons, a decrease of 10,000 tons, or less than 3 per cent, from the estimate for the preceding week, attributed to settlement of the coal strike. The output of beehive coke during the calendar year 1926 to Feb. 13 was 2,103,000 tons, an increase, when compared with the corresponding period in 1925, of 26 per cent.

### Cincinnati

#### Lower Freight Rates on Pig Iron—Buyers of Iron and Steel Waiting

**CINCINNATI,** Feb. 23.—With pig iron buying practically at a standstill the local market is dull. Consumers are adhering to a waiting policy and are purchasing only enough iron to meet current needs. There has been only a comparatively small tonnage of second quarter iron sold, and dealers believe that sales will increase substantially within two weeks. Producers in the Ironton district are refusing to yield to the pressure exerted by consumers and will not book business under \$21, base Ironton. Alabama furnaces are expected soon to begin active solicitation of second quarter orders at \$22, base Birmingham, while Tennessee iron for that delivery is now being sold in small lots at \$21.50, base Birmingham. The only sale of importance was 500 tons of malleable iron for a Columbus, Ohio, melter. The establishment of a new freight rate of \$1.89 a ton from Ironton and Jackson, Ohio, to Cincinnati should prove beneficial to southern Ohio furnaces. The new rate represents a reduction of 38c. a ton.

Based on freight rates of \$3.69 from Birmingham and \$1.89 from Ironton, we quote f.o.b. Cincinnati:

Alabama fdy., sil. 1.75 to 2.25 (base)	\$25.69
Alabama fdy., sil. 2.25 to 2.75	26.19
Tennessee fdy., sil. 1.75 to 2.25	25.19
Southern Ohio silvery, 8 per cent	32.39
So. Ohio fdy., sil. 1.75 to 2.25	22.89
Southern Ohio, malleable (nominal)	22.89

**Reinforcing Bars.**—No sales of consequence have been made in the past week, and prospects for increased demand in the immediate future are poor. Although there has been no real test of prices new billet bars nominally are quoted at 2c., Cleveland, and rail steel bars at 1.90c., mill.

**Warehouse Business.**—The volume of business in February has been considerably below the level expected by local jobbers. A period of rain and snow handicapped trade during the first part of the month, but an improvement in the weather has failed to bring out a noticeable increase in orders. The movement of structural steel and reinforcing bars is particularly sluggish. Quotations are unchanged.

**Coke.**—Prices of beehive coke declined steadily during the past week, and today furnace grades from New River and Wise County fields are selling at \$6, ovens, and \$4.50, ovens, respectively. Cancellations have not been so heavy as several dealers had feared, because many shipments were made to nearby consumers before the market broke seriously. Connellsville foundry is now bringing \$9.53, delivered Cincinnati, but little of it is coming into this territory. By-product foundry coke prices will probably remain unchanged during March.

Based on freight rates of \$2.14 from Ashland, Ky., \$3.53 from Connellsville, and \$2.59 from Wise County ovens and New River ovens, we quote f.o.b. Cincinnati: Connellsville foundry, \$9.53; Wise County foundry, \$8.09 to \$9.09; New River foundry, \$9.59 to \$10.09; by-product foundry, \$10.64.

**Finished Material.**—Consumers are adhering consistently to a waiting policy and are refusing to buy ahead. In most cases they are requesting quick deliveries, thus indicating that their stocks are well depleted. Those buyers who have contracted for their first quarter's requirements are taking only about two-thirds of their quotas. Efforts of sellers to get them to specify more liberally have been unsuccessful. The bar market has been steady at 2c., base Pittsburgh, with sales restricted to small lots. Some plate tonnage has improved but prices are soft. A few orders have been taken at 1.90c., base Pittsburgh, but the majority of business is being booked at 1.85c., with quotations of 1.80c. appearing in isolated cases. Structural shapes range from 1.90c. to 2c., base Pittsburgh. Sheets have weakened slightly. Black sheets are selling at 3.25c. to 3.35c., base Pittsburgh, with concessions being made on pickled grades. Galvanized sheets are quoted at 4.50c. to 4.60c., base Pittsburgh. Moderate sales of blue annealed have been reported at 2.50c., base Pittsburgh. There have been a few attractive orders,

however, which have been taken at 2.40c. A slightly better demand exists for black sheets at 4.40c., base Pittsburgh. One producer of sheets in this territory operated at 85 per cent of capacity during the past week, while another mill averaged 90 per cent. Mills are scheduling their operations to conform to the volume of fresh business coming in from week to week. The wire market is unchanged, with common wire nails bringing \$2.65 a keg, Pittsburgh or Ironton, and plain wire \$2.50 per 100 lb., Pittsburgh or Ironton. Fabricators state that the number of fresh projects on which they are bidding is below normal for this time of the year.

Cincinnati jobbers quote: Iron and steel bars, 3.30c. per lb.; reinforcing bars, 3.30c.; hoops, 4c. to 4.25c.; bands, 3.95c.; shapes, 3.40c.; plates, 3.40c.; cold-rolled rounds and hexagons, 3.85c.; squares, 4.35c.; open-hearth spring steel, 4.75c. to 5.75c.; No. 10 blue annealed sheets, 3.60c.; No. 28 black sheets, 4.10c. to 4.30c.; No. 28 galvanized sheets, 5.25c. to 5.40c.; No. 9 annealed wire, \$3 per 100 lb.; common wire nails, \$2.95 per keg base; cement coated nails, \$2.25 per keg; chain, \$7.55 per 100 lb. base; large round head rivets, \$3.75 base; small rivets, 65 per cent off list. Boiler tubes, prices net per 100 ft., lap-welded steel tubes, 2-in., \$18; 4-in., \$38; seamless, 2-in., \$19; 4-in., \$39.

**Old Material.**—The market has weakened further and, in the absence of sizable sales, prices are nominal. Mills are asking for suspension of shipments in some cases. Activity has been confined to small purchases of foundry grades. Heavy melting steel is quoted at \$13, with demand at a low point.

We quote dealers' buying prices, f.o.b. cars, Cincinnati:

*Per Gross Ton*

Heavy melting steel.....	\$13.00
Scrap rails for melting.....	\$13.50 to 14.00
Short rails.....	18.00 to 18.50
Relaying rails.....	<b>27.00 to 27.50</b>
Rails for rolling.....	14.50 to 15.00
Old car wheels.....	13.00 to 13.50
No. 1 locomotive tires.....	16.50 to 17.00
Railroad malleable.....	15.50 to 16.00
Agricultural malleable.....	14.50 to 15.00
Loose sheet clippings.....	8.50 to 9.50
Champion bundled sheets.....	10.50 to 11.00

*Per Net Ton*

Cast iron borings.....	8.50 to 9.00
Machine shop turnings.....	7.50 to 8.00
No. 1 machinery cast.....	19.00 to 19.50
No. 1 railroad cast.....	15.00 to 15.50
Iron axles.....	22.50 to 23.00
No. 1 railroad wrought.....	10.00 to 10.50
Pipes and flues.....	8.50 to 9.00
No. 1 busheling.....	9.50 to 10.00
Mixed busheling.....	8.50 to 9.00
Burnt cast.....	8.50 to 9.00
Stove plate.....	10.00 to 10.50
Brake shoes.....	10.00 to 10.50

## REINFORCING STEEL

### Awards of the Week Total 2318 Tons and New Contracts Up For Bids 1490 Tons

Including 1000 tons for a Baltimore warehouse, the week's awards of reinforcing bars totaled 2318 tons, while new work up for bids requires 1490 tons. Awards follow:

BALTIMORE, Montgomery Ward & Co., warehouse, 750 to 1000 tons, to Dietrich Brothers.

TERRE HAUTE, IND., East Side junior high school, 250 tons, to Laclede Steel Co., St. Louis.

CHICAGO, Cornelia Apartments, Cornelia Avenue and Sheridan Road, 400 tons, to American System of Reinforcing.

BLOOMINGTON, ILL., Williams Oil-O-Matic Heating Corporation, 100 tons of rail steel, to Calumet Steel Co.

SAN FRANCISCO, Woman's Club, 268 tons, to Truscon Steel Co.

PITTSBURGH, West Penn Hospital, 100 tons, to Metzgar & Richardson Co., Pittsburgh.

NEW YORK, R. H. Macy & Co., warehouse, 200 tons, to Concrete Steel Co.

### Reinforcing Bars Pending

Inquiries for reinforcing steel bars include the following:

NEW YORK, 550 tons, loft building, Varick and Charlton Streets.

BUFFALO, 175 tons, garbage incinerator.

DUNKIRK, N. Y., 150 tons, filtration plant.

SPRINGFIELD, ILL., water works improvements, 172 tons.

CHICAGO, Crane Co., factory building, 240 tons.

AKRON, OHIO, sewage disposal plant, 200 tons; general contract awarded to Walsh Construction Co.

## RAILROAD EQUIPMENT

### Seaboard Buys 3400 Cars—Total Ordered in Week Is 4904—Inquiries for 2762

The Seaboard Air Line bought 3400 of the 4904 freight cars ordered during the week, while three other roads placed 500 each. The Southern Railway is asking bids on 2250 cars and other inquiries bring the total up to 2762. The Southern is also in the market for 113 locomotives and the Rock Island for 25, while the Canadian National Railways have ordered 24.

Freight cars in need of repair on Feb. 1 totaled 158,160 or 6.8 per cent of the number on line, according to a report of the Car Service Division, American Railway Association. This was an increase of 2397 cars over the number reported as of Jan. 15. It was a decrease of 28,379 cars compared with the same date last year.

The Seaboard Air Line has ordered 1000 40-ton box cars and 800 50-ton gondola cars from the Pressed Steel Car Co., and 800 gondola cars each from the Standard Steel Car Co. and the American Car & Foundry Co.

The General Refractories Co. has placed 2 steel flat cars with the American Car & Foundry Co.

The New York Central has placed repairs on 10 passenger coaches with the American Car & Foundry Co.

The Rodger Ballast Car Co. has ordered 2 ballast cars from the American Car & Foundry Co.

The Sinclair Refining Co. is in the market for 2 coke cars.

The Pere Marquette is inquiring for 350 automobile box cars.

The Missouri Pacific is inquiring for 60 tank cars.

The Southern Railway is in the market for 1000 40-ton box cars, 1000 50-ton hopper cars, 250 50-ton convertible ballast cars and 113 locomotives of various types.

The Northwestern Refrigerator Line placed 500 refrigerator cars with the American Car & Foundry Co.

The Santa Fe is taking prices on 500 hopper cars.

The Chicago, North Shore & Milwaukee placed 20 passenger cars with the Cincinnati Car Co.

The Canadian National Railways have ordered 24 locomotives from the American Locomotive Co.

The Chicago, Rock Island & Pacific is inquiring for 10 Mikado locomotives and 15 mountain type.

The Delaware, Lackawanna & Western has ordered four Scotch marine boilers from the Federal Shipbuilding Co. Several hundred tons of plates will be required.

The New York Central has placed 500 automobile cars with the Merchants Despatch Transportation Co.

The Southern Railway placed 30 passenger, 15 baggage, 6 mail and baggage and 4 mail cars with the Pullman Car & Mfg. Corporation.

The Colorado & Southern is inquiring for 100 Rodger ballast cars of 50-ton capacity.

The Chicago & Eastern Illinois has placed 500 coal cars with the Mount Vernon Car & Mfg. Co.

The Northern Pacific has placed 10 observation cars with the Pullman Car & Mfg. Corporation.

### Some Reductions in Detroit Scrap

DETROIT, Feb. 23.—The market on old material in this district continues to show weakness, with borings and short turnings registering a decline of 25c. and hydraulic compressed and No. 1 busheling 50c. per ton. During the past week one of the mills in the Pittsburgh district has been in the market offering prices delivered at their mill which would exclude any material being shipped from this district.

The following prices are quoted on a gross ton basis f.o.b. producers' yards, excepting stove plate, No. 1 machinery cast and automobile cast, which are quoted on a net ton basis:

Heavy melting and shoveling steel.....	\$13.75 to \$14.25
Borings and short turnings.....	10.25 to 10.75
Long turnings.....	9.50 to 10.00
No. 1 machinery cast.....	17.00 to 18.00
Automobile cast.....	23.00 to 24.00
Hydraulic Compressed.....	12.25 to 12.75
Stove plate.....	13.50 to 14.50
No. 1 busheling.....	12.25 to 12.75
Sheet clippings.....	8.00 to 8.50
Flashings.....	10.75 to 11.25

## NON-FERROUS METALS

## The Week's Prices

Cents per Pound for Early Delivery

Copper, New York	Straits		Lead		Zinc	
	Electro- lytic*	New York	New York	St. Louis	New York	St. Louis
Feb.	Lake					
17.....	14.50	14.12 1/2	64.12 1/2	9.15	9.00	7.87 1/2
18.....	14.37 1/2	14.00	64.25	9.15	9.00	7.82 1/2
19.....	14.37 1/2	14.00	64.25	9.15	8.95	7.82 1/2
20.....	14.37 1/2	14.00	64.25	9.15	8.95	7.95
23.....	14.50	14.00	64.25	9.15	8.92 1/2	8.10
						7.75

\*Refinery quotation; delivered price 1/4c. higher.

## New York

NEW YORK, Feb. 23.

The holiday yesterday has slowed down what little activity there was and most of the markets are quiet. Copper prices are a shade easier and there is very little buying. The tin market last week was quite active at sustained high prices. The lead market is quiet with quotations slightly easier. Prime Western zinc has declined sharply.

**Copper.**—After the heavy domestic buying, as well as fairly large foreign purchases of about two weeks ago, the market has naturally turned quiet. Quotations rose to 14.37 1/2c., delivered, and most large producers still maintain that price. In the last week, however, some small producers have supplied the small current demand at 14.25c., delivered, at which level some metal is still available. Consumers are apparently well covered and producers are well sold up. An interesting fact is that several mills are asking for their April deliveries in March. Lake copper is quoted at 14.37 1/2c. to 14.50c., delivered.

**Tin.**—It develops that sales for the calendar week, ended with Saturday, Feb. 20, were very large, amounting to 1500 tons, with some estimates as high as 2000 tons. On Feb. 15 the sales were 700 tons with about 50 tons on Feb. 16, and on the two following days about 400 tons changed hands each day. Spot metal continues scarce and this is also true of February delivery. Naturally therefore sales of spot and February metal are light because of a small demand for these positions. The largest demand in the sales last week was mostly March and April delivery. The opinion prevails that consumers must buy still more for March delivery. On the New York Metal Exchange on Thursday, Feb. 18, 125 tons changed hands at relatively low prices, putting something of a damper on the market with the following day's transactions limited to 50 tons. In the opinion of well-informed circles, a bull market is not impossible because of the strong statistical position. It is pointed out that, with the world's visible supply, less by 1000 tons on Feb. 1, than on Jan. 1, with the probability of a similar contraction on March 1 and a further decline of 1500 tons on April 1, the predictions of higher prices may be fulfilled. In any event it is difficult to say just how high the market may go with prices above the peak for 1925. Spot Straits tin today was quoted at 64.75c., New York, with buying only moderate. This exceeds the highest quotation last year of 64.50c. on Nov. 12. In London today quotations were considerably higher than a week ago, with spot standard quoted at £294 7s. 6d., future standard at £283 15s. and spot Straits at £294 12s. 6d. The premium of nearly £11 for spot standard over future and the nearly equal prices for both spot standard and spot Straits tin are the surprising features of the London market. In Singapore the quotation today was £287 or nearly the same as a week ago. Arrivals thus far this month have been 3900 tons with 7790 tons reported afloat.

**Lead.**—New buying is light but consumption is still heavy with production approximately keeping pace with it. The leading interest continues to quote 9.15c., New York, as its contract price, and is apparently supplying most of the demand in this territory. In the outside market prices in the West are a little lower at 8.90c. to 8.95c., St. Louis, for early delivery.

**Zinc.**—After a further recession of prices to close to 7.45c., St. Louis, in the last week, the decline being caused by lack of demand, quotations have turned higher until today prime Western is quoted at 7.75c., St. Louis, or 8.10c., New York. The higher prices are said to be due to a stronger market abroad and to considerable activity in the last two or three days by dealers on this side. Domestic buying has not improved, due largely to the inactivity of galvanizers in the market.

**Nickel.**—Ingot nickel in wholesale lots is quoted at 35c. with shot nickel at 36c. and electrolytic nickel at 39c. per lb.

**Antimony.**—The market is quiet. Chinese metal for spot and February-March arrival is quoted at 21c., New York, duty paid, with February-March shipment at 20c., duty paid.

**Aluminum.**—Virgin metal, 98 to 99 per cent pure, is obtainable as ingots at 27c. to 28c. per lb., delivered.

**Old Metals.**—Business is good and values in the copper and brass items are firm. Dealers' selling prices, in cents per lb., are as follows:

Copper, heavy and crucible	13.75
Copper, heavy and wire	13.00
Copper, light and bottoms	12.00
Heavy machine composition	10.00
Brass, heavy	9.00
Brass, light	7.75
No. 1 red brass or composition turnings	9.25
No. 1 yellow rod brass turnings	9.35
Lead, heavy	8.50
Lead, tea	7.00
Zinc	5.00
Cast aluminum	20.50
Sheet aluminum	20.50

## Chicago

FEB. 23.—The market continues dull with copper and antimony unchanged in price. Zinc has declined, due to a falling off of export business and also to the fact that production shows further gains over consumption. Tin shows added strength and has advanced in a fairly active market. The old metal market is without feature and prices of all commodities are unchanged excepting aluminum, which has eased off. We quote, in carload lots: Lake copper, 14.75c.; tin, 65c.; lead, 9.10c.; zinc, 7.65c.; in less than carload lots, antimony, 24c. On old metals we quote copper wire, crucible shapes and copper clips, 11c.; copper bottoms, 9.25c.; red brass, 9c.; yellow brass, 8c.; lead pipe, 8c.; zinc, 5.25c.; pewter, No. 1, 37c.; tin foil, 44c.; block tin, 52c.; aluminum, 19.50c.; all being dealers' buying prices for less than carload lots.

## Non-Ferrous Rolled Products

All brass and bronze products were advanced 1/4c. per lb. as of Feb. 5. So also were copper products. Zinc and full lead sheets have not been changed in nine weeks. For New York warehouse prices see page 612.

## List Prices Per Lb., f.o.b. Mill

On Copper and Brass Products, Freight Up to 75c. Per 100 Lb. Allowed on Shipments of 500 Lb. or Over

Sheets	
High brass	19 1/4c.
Copper, hot rolled	22 3/4c.
Zinc	12c.
Lead (full sheets)	13c.
Seamless Tubes	
High brass	23 3/4c.
Copper	24 1/2c.
Rods	
High brass	16 7/8c.
Naval brass	19 5/8c.
Wire	
Copper	16 1/2c.
High brass	19 5/8c.
Copper in Rolls	21 1/2c.
Brazed Brass Tubing	27 1/2c.

## Aluminum Products in Ton Lots

The carload freight rate is allowed to destinations east of the Mississippi River and also allowed to St. Louis on shipments to destinations west of that river.

Sheets, 0 to 10 gage, 3 to 30 in. wide	37 1/2c.
Tubes, base	48c.
Machining rods	34c.

## PERSONAL

Frederick I. Sanderson was elected first vice-president of the Wellman-Seaver-Morgan Co., Cleveland, at the annual meeting Feb. 16. He has been a director since the Wellman-Smith-Owen engineering interests of London, England, acquired a large interest in the Wellman-Seaver-Morgan Co., about 18 months ago. John H. Bode, who succeeded E. S. Church as president last year, was reelected and also made a member of the board of directors. Former Senator Atlee Pomerene was added to the directorate. N. R. Fairlamb was reelected treasurer and Fred Stadelman was made secretary. In 1904, when 22 years old, Mr. Sanderson joined Jeremiah Head & Son, at that time European agents for the Wellman-Seaver-Morgan Co. He also was secretary of the Otis Steel Co., Ltd., then controlled in England. When the British company, Wellman, Seaver & Head, Ltd., was formed in 1905, Mr. Sanderson became its secretary, and in 1917 was elected its managing director. When this company was merged into the Wellman-Smith-Owen Engineering Company, Ltd., he became a director and commercial manager of that company. He is also a director of the Wellman-Smith-Owen Société Anonyme in France. Mr. Stadelman, who has been with the company for 20 years, has been manager for some years of the New York office. He studied law at the New York Law School and engineering at Columbia University, lives at Great Neck, Long Island, and was one of the organizers and for 12 years secretary of the Machinery Club, New York.

C. G. Bigelow, formerly chief engineer South Side Works, Jones & Laughlin Steel Corporation, Pittsburgh, has become associated with the Columbia Steel Co., Butler, Pa. He was with the American Sheet & Tin Plate Co. before going with the Jones & Laughlin Steel Corporation.

James E. MacMurray, of the Acme Steel Co., Chicago, has been appointed by President Coolidge as a member, from Illinois, of the National Advisory Commission to the Sesquicentennial International Exhibition Association. The exposition opens in Philadelphia on June 1.

John S. Sammons has recently been appointed sales manager of the Beardsley & Piper Co., 2541 North Keeler Avenue, Chicago. Mr. Sammons was formerly general manager of the Art Lamp Mfg. Co., Chicago, and prior to that was a department manager for Albert Pick & Co., Chicago.

George Matheson, Jr., vice-president, treasurer and general manager Spang, Chalfant & Co., Pittsburgh, has been elected a director of Mackintosh-Hemphill Co., Pittsburgh. Charles McKnight, Jr., metallurgist International Nickel Co., New York, has been elected to the place made vacant through the death of his father. Howard Evans, president Macbeth-Evans Glass Co., Pittsburgh, is another new member of the board of directors. J. Ramsey Speer, Donald Baum, J. E. Fawell and H. V. Blaxter, retiring directors, have been reelected. J. Ramsey Speer has been reelected as president of the company, Donald Baum as secretary-treasurer and J. C. McFee as assistant secretary.

A. L. W. Walsh has been elected president Lynchburg Foundry Co., Lynchburg, Va., succeeding the late Lawrence H. McWane, while Fred W. McWane, general manager for six years, has resigned.

Clifton McKenna, assistant sales manager Russell & Erwin division, American Hardware Corporation, New Britain, Conn., has resigned to take effect about April 1. He plans to take a long rest before reentering business.

James E. Wallis, who has represented the Sullivan Machinery Co., Claremont, N. H., in Japan for several years, is to leave shortly for London and Paris and will make his headquarters in London.

M. Schiller has been elected vice-president in charge of accounts and purchases, Superheater Co., 17 East Forty-second Street. W. F. Jetter becomes treasurer and assistant secretary; Bard Browne was appointed assistant to vice-president in charge of sales and service, and T. F. Morris, assistant secretary and assistant treasurer. All of these men have been long associated with the company. Mr. Schiller joined the company in 1910 when it was organized as the Locomotive Superheater Co., and has served in various administrative and executive capacities. Mr. Browne came in 1914 and has been actively identified in the application of locomotive superheaters and feedwater heating devices, serving in various engineering, sales and service capacities.

Edward F. Geer has been elected vice-president Underwood Typewriter Co., Inc., Bridgeport, Conn., to fill the vacancy caused by the death of Clinton R. Rossiter. Mr. Geer is a director of the American Ship & Commerce Corporation, the Atlantic Mail Corporation, and the East Brooklyn Savings bank.

Henry F. Pratt has been appointed sales manager American Oxygen Service Co., 225 West Thirty-fourth Street, New York. His headquarters will be in New York. He formerly was eastern manager for the Compressed Gas Corporation.

A. Westenberger, manager of the iron and steel department of Beer, Sondheimer & Co., Frankfort, Germany, is in New York at the Plaza Hotel, where he will remain for a few weeks, to make arrangements for extending the firm's export business in pig iron. Mr. Westenberger says that industrial conditions in the Frankfort region of Germany are showing a steady improvement.

Herman Steinkraus has recently assumed the representation of Bridgeport Brass Co. products, both warehouse and sales, in the Cleveland territory. A graduate of Western Reserve University, he has handled sales and organization work in managerial capacities for the Cleveland Automatic Machine Co., the Cleveland Chamber of Commerce, the Advertising Club of that city and the national secretary's office of the National Young Men's Business Clubs. For eight years he was with the Osborn Mfg. Co., from which he resigned recently as general sales manager. Mr. Steinkraus' continuous sales experience was interrupted only by his service in the World War. He enlisted as a private and was promoted to captain after being awarded the D. S. C. in the Argonne.

Fred W. Lorentz, at one time with the New Jersey Foundry & Machine Co., New York, and for seven years secretary and treasurer of the Union Iron Works, Hoboken, N. J., has joined Philip T. King, 50 Church Street, New York, dealer in used locomotive cranes, as a salesman.

August A. Malik, of the Schoeller-Bleckmann Steel Corporation, Vienna and Ternitz, Austria, accompanied by George S. Tower, of the Erie Steel Corporation, New York, spent several days in Milwaukee during the past week, inspecting shops and conferring with manufacturers.

J. E. Heeter has been appointed manager of the Philadelphia office of the Diamond Power Specialty Corporation, Detroit, manufacturer of Diamond soot-blowers. Mr. Heeter succeeds M. J. Miller, who has been transferred to the Detroit territory (page 319, THE IRON AGE, Jan. 28). Mr. Heeter was associated with Mr. Miller in the Philadelphia district for many years.

John K. Desmond, formerly with the Philadelphia district sales office of the Crucible Steel Co. of America, has been appointed Philadelphia district manager of steel sales for Henry Disston & Sons, Inc., Philadelphia.

A. V. B. Cutler has been appointed by the Acme Electric Welder Co., Los Angeles, manufacturer of electric spot welders, as representative for its product in the Middle West. Mr. Cutler's territory will be the States of Illinois, Michigan, Indiana, Ohio and Wisconsin. Offices have been opened at 817 West Washington Boulevard, Chicago, where Mr. Cutler will make his headquarters.

Directors of the Union Drawn Steel Co., Beaver Falls, Pa., following the annual meeting of the stockholders held Feb. 15, organized as follows: L. R. Davidson, chairman; E. S. Hoopes, president and general manager; E. C. Rebeske, secretary and treasurer; C. H. Beegle, vice-president and assistant secretary; George B. Mitchell, vice-president in charge of sales; H. A. May, assistant treasurer; L. E. Creighton, manager of operations, and H. G. Wasson, general counsel.

### OBITUARY

EDWARD BERTRAM PIKE, president Pike Mfg. Co., Pike, N. H., manufacturer of abrasives, died at his home Feb. 17 in his sixtieth year. In 1908 he succeeded his father, the late Edwin Burbank Pike, as head of the business which was founded in 1842. He also was president National Bank of Newbury, Wells River, Vt., and the Cortland Grinding Wheel Corporation, Chester, Mass. He was born in Salem, Mass., in 1866 and entered the employ of the Pike Mfg. Co. at the age of 20.

COL. DANIEL BERTSCH WENTZ, president American Mining congress and a former president of the National Coal Association, died at his home in Philadelphia Feb. 8. Colonel Wentz was born Sept. 4, 1872, at Jedd, Pa., and attended Phillips-Andover Academy and Harvard University. During the World War he served as colonel in the quartermaster's corps. He was president of the Virginia Coal & Iron Co., a director of the Franklin National bank, the Fidelity Trust Co., Philadelphia, the Whitehall Cement Mfg. Co., the Lehigh Coal & Navigation Co., and the Westmoreland Coal Co. He was a member of the American Institute of Mining and Metallurgical Engineers and the American Society for Testing Materials.

FRANKLIN VAN WINKLE, inventor of the Van Winkle dynamometer, engineer and associate editor of *Power*, died in the Paterson (N. J.) General Hospital on Feb. 18, as the result of a cold contracted last Thanksgiving. He was a graduate of Stevens Institute of Technology in the class of '77 and was 70 years old. He was for a time professor of engineering at Texas Agricultural and Mechanical College and for 27 years a consulting engineer. For the last 14 years he had been editing the inquiries department of *Power*. For some time he had been a member of the New Jersey Board of Boiler Rules and for 12 years served on the Paterson Board of Health. He was a descendant of the early Dutch settlers of the country.

JAMES HARRISON WHITNER, vice-president Virginia Bridge & Iron Co., died at Roanoke, Va., Feb. 10. Mr. Whitner was born in Anderson, S. C., Aug. 15, 1861, and was graduated from the Rensselaer Polytechnic Institute in 1885. He had been associated with the Virginia Bridge & Iron Co. since 1898, first in charge of its Southern contracting office at Birmingham, and for more than 20 years in charge of the company's contracting department at Roanoke. For the past eight years he had been vice-president in charge of contracting.

JACOB HAISCH, said to have been the inventor of barbed wire and to have been one of the oldest bank presidents in this country, died at DeKalb, Ill., of pneumonia. He would have been 100 years old on March 9. On Jan. 20, 1874, he obtained his first patent on an automatic machine for barbed wire manufacture. He was born in Baden, Germany, and came to this country with his parents at the age of nine. In 1846 he left his parents' home in Ohio and went to DeKalb County, Illinois, as a carpenter. While building wooden fences for farmers he conceived the idea of barbed wire. At about the time of Mr. Haisch's invention, a similar wire was invented by Joseph Farwell Glidden and I. L. Ellwood. The rivalry in the marketing of the two products resulted in litigation which ran on for years. Glidden, Ellwood and John W. Gates were in partnership. The courts never decided which patent was the original.

P. W. TOWNER, former president and general manager Steel Barrel Corporation of America, 29 Broadway, New York, died recently of pneumonia in the Staten Island Hospital, that city. He was born in Rome, Pa., in 1871.

W. E. PEASE, conservative member of Parliament for Darlington, England, died recently. He was descended from a family of Quakers. After graduation at Cambridge he became an iron merchant at Middlesbrough, later becoming chairman Cleveland Bridge & Engineering Co., Lt., Darlington. He superintended the construction of a steel bridge over the Zambesi River in Africa. He held a prominent position in the Consett Iron Co.

WILLIAM W. KENNEDY, superintendent of pipe mills, Riverside works, National Tube Co., Benwood, W. Va., died at his home in Wheeling on Feb. 19. He was 60 years old and a native of Scotland. He had been identified with the Riverside works for 45 years, starting as a boy and working up through the ranks to the position he held at the time of his death.

CHARLES V. SLOCUM, at one time president National Car Wheel Co., Pittsburgh, died at his home in that city on Feb. 21. He was with that company from the time of its organization until he retired from the presidency in 1905, when a combination with a Rochester, N. Y., company brought C. T. Chapin to the head of the company. He was a native of Granville, N. Y.

EDWIN J. RENSHAW, founder and president Nicetown Plate Washer Co., Philadelphia, died Feb. 19 at his home, 2129 North Gratz Street, after a brief illness. Mr. Renshaw, who was well known in Pennsylvania in the iron industry, formerly lived in Lebanon, and in Montreal, Canada. He went to Philadelphia 15 years ago. He is survived by Mrs. Renshaw and by three married daughters.

J. BERTLEY ARNOLD, 429 Wellington Avenue, Chicago, formerly salesman for the Illinois Steel Co., died Feb. 12 at Long Beach, Cal. He was 56 years old. He is survived by Mrs. Arnold and a sister.

PHELPS JOHNSON, chairman of the board of directors Dominion Bridge Co. and its former president, died Feb. 20 in the Royal Victoria Hotel, Montreal. He was born in 1849 and was educated in public and private schools in Springfield, Mass. He entered the employ of D. L. Harris & Co., engineers, as office boy, and later went to the R. F. Hawkins Co., became chief engineer, and in 1870 took the same position with the Wrought Iron Bridge Co., Canton, Ohio. He had no small part in the development of bridge construction during the period when the use of heavier rolling stock by the railroads compelled the abandonment of the wooden truss. He went to the Toronto Bridge Co. in 1882, and three years later was associated with the Dominion Bridge Co., Montreal, which undertook the erection of the famous Quebec Bridge across the St. Lawrence River.

## FABRICATED STEEL

### January Bookings 21 Per Cent Off from December but Ahead of January, 1925

WASHINGTON, Feb. 23.—Sales of fabricated structural steel in January, 1926, made by 179 firms with a capacity of 264,545 tons, totaled 156,935 tons, according to reports received by the Department of Commerce. The January bookings were therefore 59 per cent of capacity compared with 75 per cent of capacity in December. Computed bookings in January of the present year were 179,950 tons. Shipments for that month represented 69 per cent of the capacity of firms reporting this item, computed shipments for the entire industry being thus 210,450.

### Structural Steel Awards Show a Gain and Inquiries Also Are Larger

An improvement in the structural steel market, which has been lagging since the first of the year, is reflected in the week's report of contracts totaling nearly 35,000 tons, while new work up for bids comes close to 32,000 tons. Among the awards was 6500 tons for New York subway work, about 7200 tons for lofts and other buildings in New York and 4500 tons for a building in San Francisco. Work on which bids are being submitted includes 5000 tons for a power station in Chicago; 4900 tons for buildings at the University of Chicago; 6000 tons for a New Orleans office building; 2500 to 3000 tons for an Oregon pipe line; 4000 to 7000 tons for a San Diego, Cal., pipe line. Awards follow:

CHARLESTON, W. Va., Owens Bottle Co., warehouse, 1500 tons, to American Bridge Co.

NEW YORK, loft building, Madison Avenue and Thirty-fourth Street, 2000 tons, to Hay Foundry & Iron Works.

WEEHAWKEN, N. J., Hockmeister & Lind Co., warehouse, 100 tons, to Guibert Steel Co., Pittsburgh.

NEW YORK, temporary shoring for subway construction, 450 tons, to American Bridge Co.

NEW YORK, Board of Transportation, subway section 4 A, route No. 78, 6500 tons, to Bethlehem Steel Co.

NEW YORK, the Structural Steel Board of Trade reports the following contracts totaling 5191 tons as having been taken by members: Apartment, 27-35 West Eighty-sixth Street and hotel, 17-25 West Eighty-sixth Street, to Shoemaker Bridge Co.; bakery addition, East 165th Street and Clay Avenue, to George A. Just Co.; Architects' Building, north wing, 104-114 East Forty-first Street, to Post & McCord; Mount Sinai Hospital, nurses' home, 5-17 East Ninety-eighth Street, to Levering & Garrigues.

NEW YORK, motion picture theater, Fordham Road and Jerome Avenue, 350 tons to the Owego Bridge & Iron Works.

NEW YORK, apartment, 221 West Twelfth Street, 250 tons, to Schweibish Brothers.

NEW YORK, St. Marks Hospital, 400 tons, to Jones & Laughlin Steel Corporation.

BROOKLYN, N. Y., post office, Nostrand Avenue, 100 tons, to Joseph Gaydica Iron Works, Brooklyn.

LEONIA, N. J., bank building, 150 tons, to Silback, Meyer & Co.

NEWARK, N. J., Public Service Production Co., buildings at Athena and Trenton, N. J., total of 400 tons to the Phoenix Bridge Co.

BRIDGE, Seaboard Air Line, 1300 tons to the American Bridge Co.

BRIDGE, Long Island Railroad, New York, for Queens Boulevard, to an unnamed fabricator.

BRIDGES, Pennsylvania Railroad, one in Long Island City, N. Y., and one in Ohio, total of 900 tons, to American Bridge Co.

GREENSBORO, N. C., Southern Railway, passenger station, 600 tons to an unnamed fabricator.

PORTLAND, Me., State hospital, 625 tons, to Lehigh Structural Steel Co.

NIAGARA FALLS, N. Y., National Carbon Co., building, 200 tons, to Bollinger-Andrews Construction Co., Pittsburgh.

PITTSBURGH, West Penn Hospital, extension, 600 tons, to American Bridge Co.

PITTSBURGH, H. J. Heinz Co., building, 1500 tons, to McClintic-Marshall Co.

PITTSBURGH, Carnegie Steel Co., 3 steamboat hulls, 700 tons, to American Bridge Co.

SWISSVALE, Pa., St. Anselm's school, 100 tons, to Guibert Steel Co., Pittsburgh.

STEAMBOAT MISSISSIPPI, steel hull, 275 tons, to Howard Shipyards & Dock Co., Jeffersonville, Ind.

TAMPA, Fla., dredge pipe, 100 tons, to Pacific Coast Engineering Co., Oakland.

LINCOLNFIELD, race track, near Steger, Ill., 800 tons, to American Bridge Co.

MILWAUKEE, E. Schuster & Co., garage, 145 tons, to C. Hennecke Co., Milwaukee.

MUSCATINE, Iowa, H. J. Heinz Co., warehouse, 300 tons, to Jones & Laughlin Steel Corporation.

SAN FRANCISCO, Hunter-Dulin Building, 4500 tons, to United States Steel Products Co.

SAN FRANCISCO, Grant Building addition, 800 tons, to Moore Dry Dock Co., Oakland, Cal.

OAKLAND, Cal., Elmhurst School, 126 tons, to Pacific Coast Engineering Co., Oakland.

SAN LEANDRO, Cal., Caterpillar Tractor Co., 150 tons, to unnamed Eastern mill.

FRESNO, Cal., San Joaquin Light & Power Co., 200 tons, to Ferrum Co. of Germany.

PASADENA, Cal., telephone building, 700 tons, to Union Iron Works, Los Angeles.

PASADENA, Sterling Building, 240 tons, to Moore Dry Dock Co., Oakland.

CHEHALIS, Wash., State Training School, 120 tons, to Minneapolis Steel & Machinery Co.

SEATTLE, Wash., Pacific Coast Forge Co., plant addition, 112 tons, to unnamed fabricator through Austin Co., general contractor.

PORTLAND, Ore., 2300 tons, lock-bar pipe, to Willamette Steel Pipe Co., Portland.

### Structural Projects Pending

Inquiries for fabricated steel work include the following:

NEW YORK, subway section No. 1, route 102, 500 tons, bids open Feb. 26.

CAMDEN, N. J., International Motors Co., building, 500 tons.

WILLIAMSPORT, Pa., Elks Club, 200 tons.

JACKSONVILLE, Fla., George Washington Hotel, 500 tons.

CHICAGO, Commonwealth Edison Co., second section of the Crawford Avenue station, 5000 tons; Graham, Anderson, Probst & White, architects.

CHICAGO, University of Chicago, stadium, 1000 tons; Weibel Hall, 400 tons, and field house, 3500 tons.

CHICAGO, Great Lakes Dredge & Dock Co., dredge, 900 tons.

NEW ORLEANS, Canal & Commercial Bank Building, 6000 tons; bids opened Feb. 20.

LEWISTON, Idaho, Electric Bond & Share Co., power station, 900 tons.

MEXICO, smelter, 800 tons.

SAN RAFAEL, Cal., Marin municipal water district, 7 miles of welded steel pipe, 1500 tons; bids close March 16.

MEDFORD, Ore., 30 miles of pipe line, 2500 to 3000 tons; bids close March 9.

SAN DIEGO, Cal., 25 miles of steel or cast iron pipe, 4000 to 7000 tons of steel plate or 25,000 tons of cast iron pipe; bids to be called about March 22.

MT. SHASTA, Cal., 100 tons; bids being taken.

OAKLAND, Cal., San Leandro junior high school, 250 tons; bids rejected, new bids to be called soon.

LOS ANGELES, Advance Auto Body Works, 290 tons.

RICHMOND, Cal., bank and office building, 100 tons.

CLEVELAND, addition to the Hollenden Hotel, 600 tons.

### Reduce Pig Iron Rates from Ironton

CINCINNATI, Feb. 23.—A reduction in pig iron rates from Ironton, Ohio, to Cincinnati, Dayton, Springfield, Columbus and intermediate points has been announced by the Norfolk & Western and the Detroit, Toledo & Ironton Railroads. The new rate to Cincinnati is \$1.89 a ton, to Dayton \$2.15, to Springfield and Columbus \$1.72. Jackson, Ohio, silvery iron furnaces will be given the benefit of similar rates from Jackson to these points by the Detroit, Toledo & Ironton Railroad, whose new schedule was effective Feb. 12. The Norfolk & Western's reduction became effective Feb. 20. Beginning March 25, this carrier will make a rate of \$1.89 to Newport and Covington, Ky., absorbing the switching charges from Cincinnati to final destination.

## Discuss Machine Tool Costs

### Builders at Regional Meetings Also Take Up Installment Sales and Research— One Exposition Favored

**C**OSTS, expositions, research, uniform practice and installment selling were topics discussed at regional meetings of the National Machine Tool Builders' Association, held at Cleveland, Feb. 2, and Rockford, Ill., Feb. 4. At both meetings the present form of the association's machine tool barometer, and the idea of studying the reactions between quotations and orders were discussed.

It developed at both meetings that members have been making more cost analyses than was the custom before the association presented the Scovell Wellington & Co.'s plan of accounting. Recent changes in design have materially increased the cost of machine tools in many particulars. Changes in structure, such as substitution of heat-treated gears, for less costly gearing, have also added materially to the costs. Further refinement, and demands by users for greater accuracy, have also contributed a large share to the increased cost of machine tools.

Instances were cited of demands being made for accuracy that is unnecessary, and even impracticable. It was often buyers who have no means of checking work to the limit they are demanding, are asking for accuracy within two ten-thousandths of an inch. Honestly working to these limits would very greatly increase the cost. Poorly informed buyers have frequently accepted statements that tolerances are actually within these limits, and then proceed to buy machines on price, without checking the tolerance that they are supposed to get from the lower priced machine and accessories.

#### Quotations to Be Used in Forecasting

It was the sentiment of both meetings that the present form of machine tool barometer is more valuable than the previous form, and that all members should contribute figures on the new form. Both meet-

ings also endorsed the idea of studying the reaction between quotations and orders, if data can be procured. It was recognized that this is experimental, but the fact that inquiries precede orders makes it appear logical that if records are made of quotations, the trend of these quotations ought to forecast the trend of orders by some material time interval. It seems likely that statistics of quotations would be of high value to the industry in forecasting its actual business operations.

In regard to expositions the general sentiment was that excessive exhibiting should be discouraged. It was thought that the association's committee on expositions be supported in their investigation of the question of having an association exposition in 1927, and if this be found feasible the members should confine their exhibitions for 1927 to this one show.

Considerable interest was shown in the question of research. Both meetings were glad to hear that the Cincinnati group were active in connection with the University of Cincinnati and it was indicated that further reports on this activity as it develops, would be welcome. Uniform practices were discussed and the ideas of standardization of drawings, motor dimensions, and contracts taken up at the other regional meeting, were endorsed.

#### Installment Selling of Machine Tools Discussed

The question of installment selling was raised at the Cleveland meeting. It was felt that installment selling might perform a function in the way of expanding the market for machine tools, but it was also recognized that such sales should be made with all proper credit safeguards, and that the cost of the accommodation involved should be properly compensated. It was pointed out that a mere counter rate of interest for the time out is not adequate compensation; that other industries very well organized for installment sales do not find themselves able to safely operate without a higher charge than a current rate of interest. There would appear to be reason for organized study of the actual facts and possibilities of installment selling in the machine tool industry, and it was suggested that this topic could well form a part of the program of the spring convention.

## Car Company Loses Damage Suit

### Verdict Returned for Carnegie Steel Co. in \$2,000,000 Action Growing Out of Steel Contracts

**A**JURY in the Supreme Court of the City of New York last week returned a verdict for the Carnegie Steel Co., defendant in a \$2,000,000 suit involving alleged delayed deliveries on steel contracted for by the Pressed Steel Car Co. The plaintiff's action was prosecuted in the name of John F. MacEnulty, vice-president of the car company, as assignee.

Five contracts totaling about 145,000 tons of plates, shapes, bars and axles entered into between the Pressed Steel Car Co. and the Carnegie Steel Co. between Oct. 9, 1916, and Nov. 10 of the same year were the basis of the action. The plaintiff claimed that the Carnegie Steel Co. did not make deliveries as agreed to and that by reason of such irregularity and delay in deliveries it suffered great loss through increased overhead expenses and shut downs in some departments while awaiting material.

Testimony disclosed that the contract prices were 2.70c. to 2.75c. on shapes, 3c. to 3.10c. on plates, 2.60c. on bars and 3c. to 3.20c. on forged steel axles. In its issue of Oct. 12, 1916, THE IRON AGE quoted shapes at 2.75c., Pittsburgh, plates at 4c. and steel bars at 2.75c. The contracts provided that buyer should furnish specifications in substantially equal monthly quantities within six months from the contract date, the mill to ship "as soon after the receipt of specifications as conditions at seller's mill would permit."

A contention of the Pressed Steel Car Co. was that the custom in the steel trade is for steel companies to

furnish car material in complete sets, and that this was not done, the steel company shipping shapes, bars and axles, but not sufficient quantities of plates so that the cars could be completed. In refutation the defendant introduced testimony alleging that no such custom prevails.

The car company showed further that the Carnegie Steel Co. during that period contracted with the Ralston Steel Car Co. for the building of 1500 coke cars and furnished the material for these cars at a time when the Pressed Steel Car Co. was not getting sufficient plate tonnage to complete work on hand. The Carnegie Steel Co. alleged that war conditions arising in the early part of 1917 made it necessary to provide more cars so that it would have an adequate supply of coke for its operations, and that the contract with the Ralston Steel Car Co. was a necessary step to keep its plants running at full capacity.

On Sept. 24, 1917, the date on which the fixed prices established by the War Industries Board became effective, the Carnegie Steel Co., it was shown, had shipped all but about 3600 tons of the plates specified by the Pressed Steel Car Co. for delivery prior to that date. Between the dates of the contracts and Sept. 24, 1917, the spot market for steel plates rose to 8c. a lb. and the Pressed Steel Car Co. asked damages in the amount of the difference between this price and the price established by the War Industries Board, claiming that the plates should have been delivered while the higher price prevailed. In defense the Carnegie Steel Co. set up among other things that war conditions and the demands of the Government, which took precedence over private contracts, were the causes for the delayed deliveries. The jury returned a verdict of no cause of action.

The trial of the case took over two weeks.

# Machinery Markets and News of the Works

## DEMAND CONTINUES FAIR

### Machine Tool Buying Shows No Increase But Is Well Sustained

In Some Quarters It Is Predicted That February Sales Will Show an Increase Over Those of January

HERE is a fairly well-sustained demand for machine tools, and in some markets it is predicted that the total volume of business this month will exceed that of January. A large part of current business consists of single machine orders from widely diversi-

fied industries, but there is a sprinkling of larger orders and the outlook for more liberal purchases by some of the railroads is promising.

The Ford Motor Co., Detroit, is reported to have ordered 50 wire enameling machines of special design and 43 textile machines from a Defiance, Ohio, manufacturer. Other automobile buying has not been conspicuous, but the Nash Motors Co., Kenosha, Wis., is expected to issue a large list within the next week. Two orders for automatic lathes received by a Cincinnati builder total 13 machines.

The Florida East Coast Railway is expected to close within a week on its recent list but the Illinois Central has postponed its contemplated purchases until March.

## New York

NEW YORK, Feb. 23.

MACHINE-TOOL buying continues in fairly satisfactory volume. The past week has brought to light no large buying, but there is a fair number of orders for single machines. Considerable business from the New York Central Lines is still pending, and no action has been taken on the small list of the Delaware & Hudson Railroad. The International Motor Co., Allentown, Pa., has bought two spline milling machines and one hand milling machine; the Greist Mfg. Co., New Haven, Conn., a vertical surface grinder; the Whitney Mfg. Co., Hartford, Conn., two automatic milling machines; the New York Air Brake Co., New York, two hand milling machines; the Cleveland, Cincinnati, Chicago & St. Louis Railway (the Big Four) a journal turning and axle lathe.

Landon P. Smith, Inc., recently organized with capital stock of \$100,000, will manufacture at Irvington, N. J., the Red Devil line of glass cutters' and glaziers' tools formerly manufactured by the Smith & Hemenway Co. Landon P. Smith was president of the Smith & Hemenway Co. until it was sold to the Crescent Tool Co., Jamestown, N. Y., but in making the sale he retained the rights to manufacture the Red Devil line of tools.

The Electric Welding Co. of America, foot of Court Street, Brooklyn, is in the market for used bending rolls, minimum capacity 12 ft., with drop-end housing, belt or motor driven.

The Hoff Vending Corporation, 342 Madison Avenue, New York, has been incorporated to distribute vending machines which are being manufactured for this company on a contract basis.

The Heat Treating Co., a Delaware corporation, has recently been organized and holds the patent rights to equipment designed for the distillation of petroleum oils, fractional distillation of chemicals, etc. A license agreement has been completed between the Heat Treating Co. and the Graver Corporation, East Chicago, Ind., for the manufacture and sale of this equipment. The address of the Heat Treating Co. is in care of the Doherty Research Co., 67 Wall Street, New York.

Carr Brothers, Inc., 65 Broadway, New York, is in the market for complete equipment for making automobile and railroad steel springs, preferably used.

Bids will soon be asked by the American Meter Co., 105 West Fortieth Street, New York, for a four-story plant, 76 x 100 ft., at 563 West Forty-seventh Street, to cost about \$190,000 with equipment. Beverly S. King, 18 East Forty-first Street, is architect.

The Coldak Corporation, care of the J. G. White Management Corporation, 43 Exchange Place, New York, manufacturer of automatic electrical refrigerating machines and

equipment, is disposing of a stock issue of \$3,960,000, the proceeds to be used to acquire the property and patents of the Multicold Co., and for extensive increase in manufacturing facilities. John H. Pardee, head of the White organization, is president of the Coldak Corporation; C. M. Burnhome is vice-president.

The Simms Petroleum Co., 120 Broadway, New York, has authorized the construction of a new refining plant at Smackover, Ark., with initial capacity of 2500 bbl. per day, to cost approximately \$1,500,000. The company will also build a gasoline refinery in the same section with output of 14,000 gal. per day. Thomas W. Streeter is chairman of the board.

Charles D. King, 95 Liberty Street, New York, patent attorney, is making inquiries for a small motor-driven blower, positive blast type.

The Standard Oil Co. of New York, 26 Broadway, Engineering Department, has awarded a general contract to the J. L. Burke Corporation, 51 West Sixty-sixth Street, for a two-story storage and distributing plant, 60 x 90 ft., at U and Fifty-fifth Streets, Mill Basin, Brooklyn, to cost about \$65,000. A service and repair garage for company trucks will be built at the same location.

The Consolidated Gas Co., 130 East Fifteenth Street, New York, has filed plans for a four-story boiler plant and gas producer works, 43 x 218 ft., at Hunts Point and East Bay Avenues, Bronx, to cost \$175,000 with machinery. J. F. Hunter is company architect.

William Shary, 22 East Seventeenth Street, New York, architect, has completed plans for a six-story automobile service, repair and garage building, 100 x 100 ft., at 218-19 East Ninety-first Street, to cost about \$200,000 with equipment.

The Hudson River Foundry Co., Lansing Avenue, Poughkeepsie, N. Y., is considering the erection of a two-story addition, 45 x 76 ft., to cost about \$45,000.

The Prest-O-Lite Co., Inc., 30 East Forty-second street, New York, manufacturer of acetylene apparatus, etc., is said to be planning the erection of a new branch plant on Stewart Avenue, Atlanta, Ga., to cost \$165,000 with equipment.

Frank Braun, 29 Hamilton Street, Albany, N. Y., is considering the erection of a three-story automobile service, repair and garage building on Hamilton Street, to cost approximately \$300,000 with equipment.

The Grasselli Chemical Co., 347 Madison Avenue, New York, manufacturer of industrial chemicals, etc., with plants in New Jersey, Pennsylvania and other States, is arranging for an increase of about \$2,000,000 in present capital, a large part of the proceeds to be used for plant expansion and equipment installation. Headquarters are at Cleveland.

The Somerville Iron Works, Somerville, N. J., manufacturer of cast iron soil pipe and fittings, has leased about one acre at Quincy Avenue, S. E., and East Ninety-fifth Street, Cleveland, as a site for a new factory branch and distributing plant. Plans will soon be drawn for proposed buildings.

## The Crane Market

**T**HREE is a fair volume of inquiry for hand power cranes and electric overhead cranes of small capacity, but purchasing continues small. Some sizable business is reported in prospect, but formal inquiries have not yet been issued. A similar situation prevails in locomotive cranes, inquiries from contractors figuring on future business being a feature of the market. Manufacturers of magnets are reported to have returned to the former practice of giving a discount on magnets purchased for resale. Among current inquiries the 35-ton electric overhead crane for the New England Power Co. will probably be placed shortly. The locomotive crane pile driver for the Erie Railroad is also expected to close in a few days. The Phoenix Utility Co., 71 Broadway, New York, will probably secure new bids on the 35-ton overhead crane for Ecuador, which has been pending for several months.

The Van Vlaanderen Machine Co., 2 Broadway, Paterson, N. J., manufacturer of textile machinery, is having plans drawn for a two-story addition, 40 x 76 ft., including improvements in present plant, estimated to cost \$100,000 with machinery.

Fire, Feb. 12, destroyed a portion of Plant No. 2, of the Roessler & Hasslacher Chemical Co., Perth Amboy, N. J., with loss reported at \$45,000, including vats and other equipment. It is planned to rebuild. Headquarters are at 709 Sixth Avenue, New York.

The Jersey Central Light & Power Co., Morristown, N. J., has acquired the New Jersey Gas & Electric Co., operating at Dover and vicinity. Plans are under way for extensions and improvements in the purchased property, including the installation of additional equipment at Stanhope and Netcong.

The Board of Education, West Paterson, N. J., has plans for a two-story trade and vocational school, 85 x 160 ft., on McBride Avenue, to cost \$150,000 with equipment. Lee & Hewitt, 152 Market Street, Paterson, are architects.

The Tarrytown Hygela Ice Co., Division Street, Tarrytown, N. Y., has filed plans for a one-story addition, 70 x 125 ft., to cost \$50,000. Benton S. Russell, 70 East Forty-fifth Street, New York, is architect.

The Robert Gair Co., 50 Washington Street, Brooklyn, manufacturer of corrugated paper boxes, containers, etc., has plans for a two-story and basement plant, 160 x 350 ft., at Piermont, N. Y., to cost \$275,000 with machinery. William Higginson, 15 Park Row, New York, is architect.

The Board of Education, South Orange School District, South Orange, N. J., is considering the installation of manual training equipment in its proposed three-story high school at Academy Street and Parker Avenue, estimated to cost \$450,000, for which bids are being asked on general contract. Guilbert & Betelle, Chamber of Commerce Building, Newark, N. J., are architects.

## Philadelphia

PHILADELPHIA, Feb. 23.

BIDS are being taken by Robert McNeil, 2347 Reese Street, Philadelphia, manufacturer of chemicals, for a four-story and basement plant, 60 x 100 ft., at Cambria and Seventeenth Streets, to cost \$140,000 with machinery. Clarence E. Wunder, 1529 Locust Street, is architect.

The Pennsylvania Railroad Co., Broad Street Station, Philadelphia, will begin the erection of a two-story addition at its car shops at Altoona, Pa., 36 x 80 ft., equipped as a scales building and for kindred mechanical service, estimated to cost \$120,000 with machinery.

The Kensington Hygeia Ice Co., Trenton Avenue and Washington Street, Philadelphia, has plans for a one-story plant to cost \$26,000.

Ovens, power equipment, conveying and other machinery will be installed in the proposed two-story and basement plant to be erected on Walnut Street, Reading, Pa., by the Freihofer Baking Co., Twentieth Street and Indiana Avenue, Philadelphia, estimated to cost \$110,000.

The Crew-Levick Co., 219 North Broad Street, Philadelphia, refined oil products and gasoline, is reported to have preliminary plans under way for a two-story storage and distributing plant at Harrisburg, Pa., to cost close to \$50,000 with equipment.

The Board of Education, Hazleton, Pa., plans the installation of manual training equipment in a proposed three-story high school to cost \$500,000, for which bids

have been asked on a general contract. Laurie, Green & Co., 116 Locust Street, Harrisburg, Pa., are architects. J. J. Nesbitt, 213 Vermont Avenue, Atlantic City, N. J., is engineer.

The Electrothermic Corporation, 636 East State Street, Trenton, N. J., manufacturer of electrical apparatus, has plans for a one and two-story plant at Fernwood, N. J., 62 x 200 ft., to cost approximately \$50,000 with equipment. M. Ward Easby, Schaff Building, 1505 Race Street, is architect.

The Pennsylvania Power & Light Co., Allentown, Pa., has acquired the municipal electric light and power plant at Mifflinburg, Pa., and plans extensions, including transmission line construction.

A new company, the Public Industries Corporation, headed by Edward M. Welles, New York, and associates, has acquired the plant and business of the Reading Hardware Co., Sixth and Willow Streets, Reading, Pa., for \$3,900,000. The plant has been giving employment to about 1000 operatives. The new owner contemplates early expansion, including the establishment of several additional departments for other branches of hardware manufacture. One of the conditions of the sale is that the plant shall continue at Reading and extensions will be carried out at the present works. George D. Horst has been president of the company since last summer, succeeding Lambert A. Rehr, deceased.

The Carlisle School District, Carlisle, Pa., plans the installation of manual training equipment in a proposed two-story high school to cost \$250,000, for which preliminary plans are being drawn by Laurie, Green & Co., 116 Locust Street, Harrisburg, Pa., architects.

The Honesdale Radio Corporation, Honesdale, Pa., recently organized to establish a local plant, has been chartered under Delaware laws with a capital of \$350,000, and will carry out its proposed factory project at once. The new company is headed by L. A. Dorfman, vice-president and general manager of the Rova Radio Corporation, 119 West Nineteenth Street, New York.

The Bethlehem Chemical Co., Wilmington, Del., has closed negotiations for the purchase of the former plant of the Artillery Fuse Co., South Wilmington, idle for some time, and will establish a works at this location. Machinery will be installed for an initial unit to give employment to about 100, and which will be extended later. E. F. Johnson is vice-president and treasurer; and T. M. Smith, secretary.

The Dallas Township School District, Dallas, Pa., plans the installation of manual training equipment in its proposed two-story and basement high and grade school, estimated to cost \$115,000, for which plans are being prepared by J. S. Pettebone, Second National Bank Building, Wilkes-Barre, Pa., architect.

The Frederick Grundy Iron Works, Inc., Sophia and Van Horn Streets, Philadelphia, has been incorporated with capital stock of \$20,000, to take over the business conducted by Frederick Grundy, manufacturer of architectural iron work. The change to a corporate firm is a step toward further development of the business.

The Germeyer Engineering Co., Inc., 601 Walnut Street, Harrisburg, Pa., has recently been incorporated with capital stock of \$10,000. Since September, 1925, it has been manufacturing the Germeyer blower, but expects in the near future to develop a line of control apparatus for small combustion units. It also expects to develop a line of larger blowers for combustion uses principally that will handle boiler units up to about 1000 hp. W. D. Germeyer, president, has had about fifteen years' experience in steel

mill engineering work, having served as mechanic, electrician, draftsman, master mechanic, chief engineer and assistant general manager during this period. About six years ago he opened an office in Harrisburg for consulting work. The present company is the result of this experience in designing and building blowers for the past five years.

## Chicago

CHICAGO, Feb. 23.

**C**HICAGO machine-tool dealers are actively engaged in working on railroad lists recently issued. These lists swell, to a considerable extent, the already large number of inquiries which are before the trade. The week just closed yielded less actual buying than the previous seven days. Dealers, sizing up the number of inquiries at the beginning of the present month, anticipated a heavier buying movement than has yet been realized. Many prospective buyers are interested in planers, and makers of turret lathes report numerous inquiries from a diversity of manufacturers who are looking for equipment for their maintenance shops.

The delivery situation has not been altered materially within the past month, and prices remain unchanged. The Nash Motors Co., Kenosha, Wis., has purchased a 36-in. planer from the G. A. Gray Co., Cincinnati. It is reported that delivery was a factor in this order. It is understood that this motor car manufacturer will issue, next week, a sizable list of standard and production machine tools. The Chicago & North Western is inquiring for a 24-in. standard pattern planer and two 15-in. x 5-ft. portable engine lathes, and is asking for alternate bids on two 12-in. x 5-ft. portable engine lathes. The city of Chicago is inquiring for a single-spindle ball bearing drill. The Inland Steel Co., Chicago, has bought a 26-in. x 8-ft. tool room planer. The Automatic Electric Co., Chicago, bought a rotary surface grinder. The Rock Island is inquiring for a 36-in. x 36-in. x 12-ft. motor-driven planer for its Dalhart, Tex., shops, and a 53-in., motor-driven, vertical boring mill for the Silvis, Ill., shops.

The Frank Foundries Corporation, Moline, Ill., is acquiring additional property at its No. 1 plant at Davenport, Iowa, for the erection of a new cleaning room, machine shop and warehouse which will increase the molding and core making capacity about 50 per cent. The company has also acquired two acres adjacent to its No. 2 foundry at Moline for the erection of a third unit which when completed will accommodate 100 molders. One-third of this capacity will be built at once, including a foundry, 100 x 200 ft.; core room, 60 x 80 ft.; cleaning room, 60 x 60 ft., as well as sand storage and other departments. Harry J. Frank is manager of the Davenport plant and A. E. Hageboeck manager at Moline.

The Donahue Steel Products Co., 204 North Jefferson Street, Chicago, is in the market for the following used equipment: 1½-in. Acme upsetter, 2500-lb. board drop hammer, one 70-ft. span, 10 or 15-ton traveling crane, trimming presses, bulldozers, single and double end punch presses, threading machines, and other tools.

Contract has been awarded by the Tinker Toys Co., Inc., 721 Custer Street, Evanston, Ill., to the W. E. O'Neil Construction Co., 19 South La Salle Street, Chicago, for a four-story and basement addition, 120 x 200 ft., to cost \$130,000 with equipment.

The Western Flour Co., Davenport, Iowa, has plans under advisement for rebuilding the portion of its mill destroyed by fire Feb. 12, with loss estimated at \$200,000, including machinery.

The Auto Engine Works, Inc., 1200 University Avenue, St. Paul, Minn., will soon take bids for a two-story and basement machine shop, 100 x 175 ft., to cost about \$60,000 with equipment. J. W. Stevens, Exchange Bank, is architect. J. D. Mooney is president.

The Great Western Sugar Co., Sugar Building, Denver, Colo., is said to be completing arrangements for the construction of its proposed new mill at Gering, Neb., estimated to cost \$1,250,000 with machinery.

The City Council, Madison, Neb., is considering plans for the construction of a municipal electric light and power plant estimated to cost \$90,000 with equipment.

The Board of Education, Minneapolis, Minn., is considering the installation of manual training equipment in its proposed two-story and basement junior high school estimated

to cost \$200,000 for which it is expected to ask bids on a general contract early in April. Plans are being drawn by the Department of Buildings. G. F. Womrath is business superintendent.

C. R. Canfield, 6232 South Bishop Street, Chicago, has awarded a general contract to the Carnegie Co., 6 North Clark Street, for a one-story machine shop, 80 x 125 ft., to cost \$25,000. R. C. Clark, 7218 Harvard Avenue, is architect.

The Board of Education, Grand Forks, N. D., plans the installation of manual training equipment in the proposed four-story and basement addition to the local high school to cost \$200,000, for which bids will be asked soon on general contract. Joseph B. DeRemer, Security Building, is architect.

The Northwestern Public Service Co., Columbus, Neb., will soon take bids for the erection of its proposed new steam-operated electric power plant to cost \$100,000 with equipment.

The Jewel Electrical Instrument Co., 1650 Walnut Street, Chicago, will soon place contract for the erection of a proposed two-story addition, 75 x 100 ft., to cost \$45,000 with equipment. F. A. Randall, 160 North La Salle Street, is engineer.

The City Council, Atlantic, Iowa, is planning to ask bids soon for water-softening equipment for the municipal light and power plant.

The Model Brass Foundry, 502 South Franklin Street, Chicago, will begin construction soon on an addition to its foundry, 32 x 45-ft., to cost \$2500 without equipment.

Fire recently destroyed the roundhouse and two engines of the Chicago & North Western Railroad at Oakes, N. Dak., with a loss of \$40,000.

## Cincinnati

CINCINNATI, Feb. 23.

**P**URCHASES by automobile makers have enlivened the local machine-tool market the past week. Two manufacturers, one in the East, and the other in the Detroit district, have bought a total of 13 automatic lathes from a Cincinnati builder. The Ford Motor Co. is reported to have placed an order for 50 specially designed wire enameling machines and 43 textile machines with a Defiance, Ohio, company. Other firms in the automotive industry have purchased small lots of tools. While a few scattered sales have been made to railroads, carriers are expected to buy heavily in the next month. It is understood that the Florida East Coast will close against its list within a week, but the Illinois Central has postponed action on its tools until March. Several local builders are bidding actively for business to be placed soon by electrical manufacturers.

The Monongahela Railway Co., Brownsville, Pa., bought a 1500-lb. single frame steam hammer from the Niles-Bement-Pond Co. A Pasadena, Cal., company purchased a 20-in. drill, and the Fort Worth & Denver Railroad took an 18-in. Ranson motor-driven grinder. Five 16-in. engine lathes will be bought within 10 days by a St. Louis manufacturer. The New York Central and the Baltimore & Ohio are each inquiring for an 18-in. x 8-ft. lathe. A company in Providence, R. I., is expected to close for four lathes for shipment to its branch plant at Asheville, N. C. The Remy Electric Co., Anderson, Ind., is the buyer of a jig borer and a Pratt & Whitney vertical shaper. The Cincinnati Planer Co. sold a 30-in. planer to an Ohio manufacturer and a 6-ft. boring mill in the New York territory.

The Record Garage Co., Third Street, Cincinnati, is considering the construction of an eight-story service, repair and garage building, 100 x 175 ft., on Third Street, to cost \$450,000 with equipment. J. C. Eaton is head.

The Inland Mfg. Co., 130 Coleman Street, Dayton, Ohio, manufacturer of automobile steering wheel locks and devices, has taken out a permit to build a two-story addition to cost about \$60,000, for which a general contract has been let to Frank Hill Smith, Inc., Winters Bank Building. J. L. Pratt is president.

The Wartrace Ice Co., Wartrace, Tenn., is having plans drawn for a one and two-story plant, 35 x 62 ft., to cost about \$25,000. Radabaugh & Corbett, 218 Tenth Avenue North, Nashville, Tenn., are architects.

The Columbian Iron Works, Inc., Chattanooga, Tenn., has tentative plans for a one-story addition to its machine shop to cost \$20,000.

The Cumberland Portland Cement Co., Nashville, Tenn., is being organized by officials of Davidson, Hicks & Greene, 100 Russell Street, to construct a mill at Cowan, Tenn., where property has been secured. It will have an initial output of 2000 bbl. per day, and is reported to cost close to \$1,300,000 with machinery.

The Krystal Rok Stucco Co., New Bremen, Ohio, has plans under way for an addition to manufacture a new stucco building material, with the installation of kilns, mixing machinery, bagging equipment, etc. It is estimated to cost about \$10,000 with machinery.

The Standard Sanitary Mfg. Co., Bessemer Building, Pittsburgh, will soon break ground for a four-story factory branch and distributing plant on Beale Street, Memphis, Tenn., 70 x 225 ft., to cost about \$275,000 with equipment. Hunker & Cairns, Hill Building, Memphis, are architects.

The Kentucky-Tennessee Light & Power Co., Bowling Green, Ky., has secured a preliminary permit for a proposed hydroelectric power project on the Green River, McLean County, at United States dams Nos. 2 and 3. It is purposed to begin work soon. The initial plant will have a capacity of about 6000 hp., and Plant No. 2, about 4200 hp. A transmission line will be constructed throughout this territory.

The Boye & Emmons Machine Tool Co., Cincinnati, has let contract to the Austin Co. for a new building to replace one recently destroyed by fire.

## Pittsburgh

PITTSBURGH, Feb. 23.

**S**ALES of machine-tools in this district still are very few, but inquiry is fairly good, particularly for special adaptations of standard tools, and the trade has not lost hope that considerable business which has been pending for the past few weeks will be closed shortly. February sales have made a poor showing compared with January, but the metal working industries have not been as busy this month as last and this has naturally created some hesitation in new equipment purchases.

The electrical equipment market in Pittsburgh is showing considerable activity. The Standard Seamless Tube Co., Economy, Pa., was a recent buyer of a good sized piercing mill motor from the General Electric Co. The Carnegie Steel Co., will soon buy a 15,000-kw. turbine and condenser for its Edgar Thomson works and a 10,000-kw. unit and condenser for its Clairton works. There is pending also the electrical equipment for several mills for the Columbia Steel Co., Butler, Pa.

The Monongahela Railroad has bought a 1500-lb. steam hammer from the Niles-Bement-Pond Co.

In addition to a hydroelectric power plant now in course of construction on the Cheat River, near Cheat River, Pa., the West Virginia Power & Transmission Co., West Penn Building, Pittsburgh, has preliminary plans for a number of similar stations on the same stream to develop a total output of approximately 500,000 hp. The initial plant will have a capacity of 64,000 hp. and machinery installation will begin in the near future. An extensive transmission system will be built in western Pennsylvania and West Virginia. The company is a subsidiary of the West Penn Railways Co., same address.

The Reynolds Table Co., Reynoldsville, Pa., is reported to be planning the erection of a new furniture factory in the vicinity of Industrial Hill, near Reynoldsville, to cost \$30,000 with equipment. J. J. Joyce is superintendent.

The United Electric Light Co., Braddock, Pa., is having plans completed for a new steam-operated electric power plant on local site, to cost \$200,000 with machinery. Day & Zimmerman, 1600 Walnut Street, Philadelphia, are engineers.

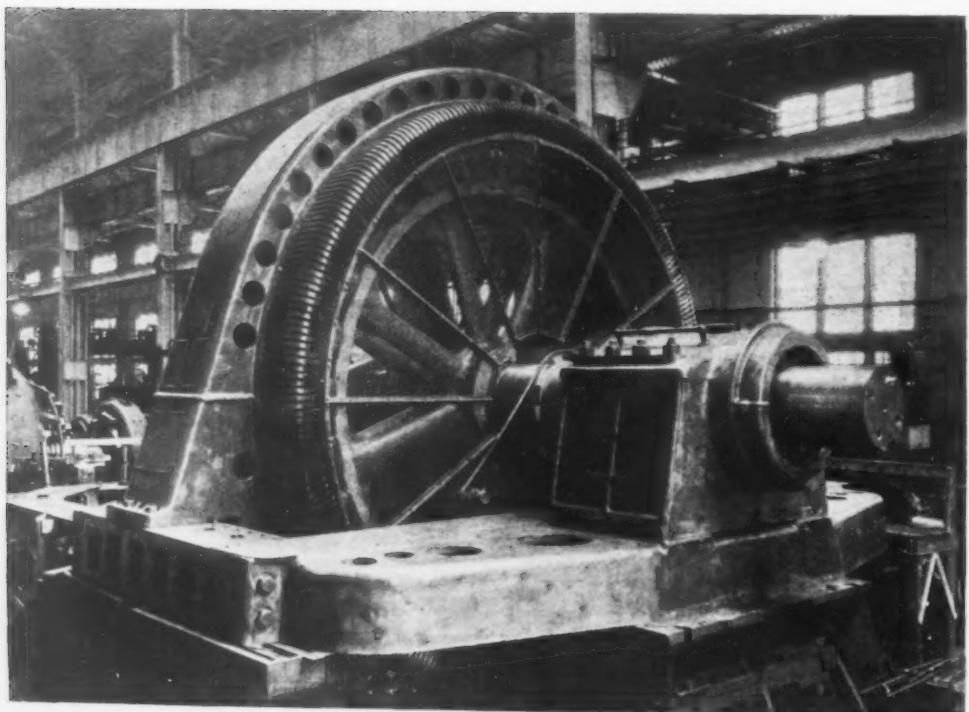
Brodie M. Williams, First National Bank Building, Welch, W. Va., has been making inquiries to locate a shop equipped to make models of a patented washing machine for display and demonstration purposes.

The Board of Education, Erie, Pa., is said to have plans for the installation of manual training equipment in the proposed three-story addition to the Wayne school at Sixth and East Streets, estimated to cost \$300,000, for which bids have been asked on general contract. W. Myers, Library Building, is architect.

The Litter Piston Mfg. Co., 744 Virginia Street, West, Charleston, W. Va., plans the installation of grinding equipment, piston-turning equipment, lathe and other tools, in connection with a proposed addition.

The Edgewater Steel Co., Pittsburgh, is in the market for several used machines, including a motor-driven power press, 400 tons capacity, 12-in. stroke; hydraulic press of 400 tons capacity, 12-in. stroke and another of 300 tons capacity, 6-in. stroke; also a hydraulic accumulator, 10-in. to 12-in. dia. ram, 12-ft. to 14-ft. stroke.

The Vulcan Mold & Iron Co., Latrobe, Pa., has appointed Park & Williams, Inc., Real Estate Trust Building, Philadelphia, as its selling agent in the Eastern Pennsylvania district for the sale of ingot molds. The company has been represented in that territory by C. C. Ostrom, who has recently been elected president Foster-Merriam Co., Meriden, Conn., castings manufacturer.



**WITH a Rating of 9000 Hp., the Synchronous Motor Shown at the Left Is Credited With Having the Highest Continuous Horsepower Capacity of Any Industrial Motor in the World. It is pictured as it appeared in the shops of the General Electric Co. preparatory to shipping to the McKinney Steel Co.'s River Furnace plant at Cleveland, where it will be direct connected to a Morgan continuous billet mill soon to be placed in operation. The mill will have ten stands of rolls and will be the first large steel rolling mill in the world to be driven by a synchronous motor, the usual practice having been to use an induction machine.**

## Cleveland

CLEVELAND, Feb. 23.

MACHINE-TOOL business as a whole seems to have been a little more lively the past week than earlier in the month, and February sales will show a gain over January. While some dealers report business quiet, several local machine-tool manufacturers are booking a fair volume of orders, mostly for single machines and coming from widely diversified industries. Demand for turret lathes is holding up very well. Planers are in fair demand. Manufacturers of punching and shearing machinery are getting a rather satisfactory amount of single tool business from fabricating shops. Presses are rather quiet, the call being almost wholly for small machines. Electrical equipment is moving fairly well.

The Owen Bucket Co., Rockefeller Building, Cleveland, will need a few tools for a new plant which it will build shortly. The General Electric Co., has purchased a Pratt & Whitney Jig boring machine for its incandescent lamp department in Cleveland. The Lima Locomotive Works, Lima, Ohio, has an inquiry out for an 8000 lb. steam hammer. The Cleveland Planer Co. has taken an order from southern Ohio for a 36-in. x 12-ft. planer. The Davis Tool Engineering Co., Detroit, and Frederick Coleman & Son, Detroit, have each bought Pratt & Whitney 30-in. cylindrical grinders.

The Owens Bottle Co., 1401 Nicholas Building, Toledo, Ohio, has placed a general contract with the Rust Engineering Co., 511 Ross Street, Pittsburgh, for two two-story buildings, 120 x 436 ft., and 120 x 612 ft., respectively. Devore & Co., Nicholas Building, Toledo, are the architects.

The Glantz Brass Foundry Co., 3005 East Fifty-fifth Street, Cleveland, has awarded a contract for two one-story foundry additions, 60 x 126 ft., and 24 x 30 ft., respectively.

The American Fork & Hoe Co., Keith Building, Cleveland, is having plans prepared for additions and alterations to its Ashtabula plant, at an estimated cost of \$140,000.

The John H. Fitch Co., 102 Wick Avenue, Youngstown, will shortly place contracts for a three-story, 63 x 327 ft. garage. Shank & Fisher, 6007 Euclid Avenue, Cleveland, are the architects.

The Union Metal & Mfg. Co., Canton, Ohio, has purchased the plant and equipment of the Canton Standard Mfg. Co. The Union Company will operate it as plant No. 2.

The Rex File Co., Newcomerstown, Ohio, has let contracts for the construction of a new plant and when completed will move its equipment from the present factory at Newark, N. J. The new plant will be ready for operation about April 15 and will be devoted to the manufacture of rasps and files. Alfred Heller is manager.

## Buffalo

BUFFALO, Feb. 23.

CONTRACT has been let by the Yawman & Erbe Mfg. Co., 1099 Jay Street, Rochester, N. Y., manufacturer of steel filing cabinets, safes, etc., to the H. Stallman's Sons Co., Central Trust Building, for a three-story and basement addition, 60 x 121 ft., to cost \$160,000. Smith, Hinchman & Grylls, Marquette Building, Detroit, are architects. Gustav Erbe is president.

The Bronzo Alumina Corporation, 212 Winchester Avenue, Buffalo, manufacturer of aluminum castings, etc., is said to be planning the installation of additional tools and equipment at its plant.

The Buffalo Slag Co., 1072 Ellicott Square, Buffalo, has awarded a contract to the Federal Concrete Co., 677 Wyoming Avenue, for rebuilding its slag mill at Erie, Pa., recently partially destroyed by fire. It will cost about \$150,000 with equipment.

The Republic Metalware Co., 90 Alabama Street, Buffalo, has plans for extensions and improvements in its three-story factory. Hudson & Hudson, Dun Building, are architects. C. W. Wells is president.

The Federal Ice & Coal Co., 761 Kensington Avenue, Buffalo, is considering the construction of a one-story ice-manufacturing plant to cost \$60,000 with equipment.

The Board of Trustees, Cornell University, Ithaca, N. Y., plans the installation of pumping equipment in connection with a new water supply system at the institution. An appropriation of \$175,000 has been made.

The Board of Education, Endicott, N. Y., is considering the installation of manual training equipment in its proposed union high school on Main Street, estimated to cost

\$350,000, for which plans are being drawn by T. I. Lacey & Son, Press Building, Binghamton, N. Y., architects.

The Howe-Bassett Co., 23 Stillson Street, Rochester, N. Y., plumbing equipment and supplies, is considering the erection of a one-story shop for pipe-cutting, threading, etc. Horace W. Jones is vice-president.

The American Radiator Co., 1807 Elmwood Avenue, Buffalo, has asked bids on general contract for a one-story addition to its malleable iron plant, 100 x 300 ft., to cost \$100,000 with equipment. L. A. Hardin, 1335 Main Street, is architect. The company will also make alterations and improvements in a present one-story building at the same works, 360 x 580 ft., to cost about \$50,000. Bids will be asked early in March for a one-story addition to the Bond plant on Rano Street, 150 x 225 ft.

The Board of Education, Dansville, N. Y., plans the installation of manual training equipment in its proposed two-story and basement high school, estimated to cost \$250,000, for which bids will be asked on a general contract in the spring. Martin C. Miller, 70 West Chippewa Street, Buffalo, is architect.

The Syracuse Supply Co., Syracuse, N. Y., is in the market for a used motor-driven punch of the following dimensions: Depth of throat, 4 ft. 6 in., height of throat, 20 to 24 in., capacity to punch 1-in. hole in 1-in. plates.

The North East Electric Co., Rochester, N. Y., A. M. Anderson, purchasing agent, is inquiring for a used No. 1 Townsend riveter.

The Dobie Foundry & Machine Co., Niagara Falls, N. Y., will erect an addition to its plant.

The Fedders Mfg. Co., 57 Tonawanda Street, Buffalo, will erect a plant to cost \$50,000.

## Detroit

DETROIT, Feb. 23.

BIDS have been asked by the Huggins Tool Co., Highland Park, Detroit, for a one-story addition, 100 x 120 ft., to cost \$50,000 with equipment. R. Arthur Bailey, 92 Peterboro Street, Detroit, are architects.

The Premier Warm Air Heater Co., Dowagiac, Mich., is said to be considering the erection of a one- and two-story addition, 100 x 100 ft., with portion of structure to be equipped for storage and distributing service.

The Board of Education of Breitung Township, Iron Mountain, Mich., plans the installation of manual training equipment in the proposed addition to the local high school, reported to cost \$200,000. F. E. and G. F. Parmelee, Iron Mountain, are architects. The present school is located in the Kingsford Heights section, a suburb.

The Detroit Stoker Co., Monroe, Mich., will remove its foundry business from Bowling Green, Ohio, to its Monroe works, which will be arranged to accommodate the increase. Facilities will be provided for the employment of about 60 men in the new foundry.

The Ira Lee Suction Cleaner Co., 2821 Brooklyn Avenue, Detroit, manufacturer of vacuum cleaners and parts, has tentative plans for the first unit of its proposed factory at Bay City, Mich., to cost about \$40,000. The main works of the company will be located here, and other units will be constructed later.

The North American Co., Cleveland, operating electric light and power properties, has acquired the Iron Mountain Light & Power Co., Iron Mountain, Mich., and the Niagara Light & Power Co., Niagara, Wis., in the peninsular section. The new owner is considering plans for extensions and the installation of additional equipment. Additions will be made in the transmission system.

The Hannah & Lay Milling Co., Traverse City, Mich., has plans under way for rebuilding the portion of its milling plant recently destroyed by fire with loss estimated at \$75,000, including machinery.

The Consolidated Boilers, Inc., Chicago, manufacturer of boilers for domestic service, has negotiations under way with the Chamber of Commerce, Benton Harbor, Mich., for the establishment of a local plant. The company proposes to erect a new building, remove present equipment to this site and install additional machinery for considerable increase in output. The entire project will cost about \$100,000.

The Bay City Dredge Works, Inc., Bay City, Mich., manufacturer of dredges and heavy machinery, is said to be considering a one-story addition to its plant, 50 x 110 ft., to cost \$40,000 with equipment. W. S. Ramsay is president.

The National Tool Salvage Co., Detroit, has been organized to take over and consolidate the Tool Salvage Co. and the National Grinding Co., both operating local factories. Plans are under advisement for expansion. Frank

E. Price is chairman of the board, and H. M. Lewis, president.

The Baldwin Rubber Co., Clinton, Mich., will soon take bids for a one-story addition, 70 x 90 ft., at Pontiac, Mich., to cost about \$35,000 with equipment. Bids formerly received have been rejected.

The Imperial Mfg. Co., Grand Haven, Mich., manufacturer of cedar chests, etc., has tentative plans for the removal of its plant to Cadillac, Mich., where it is purposed to increase the capacity.

The Vulcan Iron & Wire Works, 409 East Fort Street, Detroit, has been incorporated to manufacture wire and iron work, steel stairs, fire escapes and tanks, wire work for factories, such as machinery guards, partitions and door guards, also tool cribs. Thomas J. DeLaney is president.

The Marshall Foundry Co., Marshall, Mich., was recently incorporated with capital stock of \$125,000. This does not involve any change in the company's business, which is that of manufacturing both gray iron and semi-steel castings. Some new equipment will probably be purchased in the near future. H. A. McDonough is president.

The Erie Foundry Co., Erie, Pa., has sold two steam drop hammers and two board drop hammers to Dodge Brothers, Inc., Detroit.

The Llewellyn Steel Co., General Motors Building, Detroit, is in the market for 96-in. power shears for cutting sheets No. 16 gage and lighter.

## New England

BOSTON, Feb. 23.

MACHINE-TOOL business is more active, but practically all sales the past week were of single tools, mostly used, and were without special significance. Demand covers a wide variety of equipment, but apparently runs more to lathes, grinding machines, drills and milling machines. Massachusetts shops are the most active buyers, especially those within a short distance of Boston. There seems to be a concerted movement among shops in this State to replace worn out equipment and to secure production tools. Connecticut is second in activity; Rhode Island is a poor third, and Maine, New Hampshire and Vermont shops evince little interest in machine tools just now. There are still several important deals pending, which may close this month. New inquiries hold up well, but run almost exclusively to single machines.

Bids close March 3 for ventilating fans, motors, air washers and other equipment required by the Library Department, Boston.

The D. R. Campbell Machine Co., 52 Purchase Street, Boston, has under advisement bids on a contemplated one-story, 40 x 110 ft. plant in Dorchester. Brainard & Leeds, 89 Franklin Street, Boston, are the architects.

The Mack Motor Truck Co., 75 North Beacon Street, Allston, Boston, will close bids Feb. 27 for a service station at Worcester, Mass. The Warren Engineering Co., Terminal Wharf, Charlestown, Boston, is in charge.

Motors and other equipment will be required for a four-story, 134 x 140 ft. mill for the Cranston Worsted Co., 180 Thomas Street, Bristol, R. I., plans for which will be ready about March 15. Jenks & Ballou, 1035 Grosvenor Building, Providence, R. I., are architects.

Bids will close Feb. 26 for a two-story, 45 x 70 ft. mechanics art unit for the State Normal School, Keene, N. H. C. R. Whitcher, 318 Elm Street, Manchester, N. H., is the architect.

The Marlin Firearms Co., New Haven, Conn., which was established in 1870, has been incorporated with capital stock of \$450,000. The stock control was purchased in 1924 by Frank Kenna and the change to a corporate firm involves no other changes in the character of the business, which is that of manufacturing firearms.

The Alden Mfg. Co., Springfield, Mass., has tentative plans for rebuilding the portion of its radio and electrical equipment manufacturing plant destroyed by fire Feb. 13, with loss reported at \$25,000 including machinery.

The Schwartz Co., 284 Main Street, Danbury, Conn., has plans for a two-story automobile service, repair and garage building, 80 x 100 ft., to cost about \$70,000 with equipment.

The Monadnock Paper Mills, Inc., Bennington, Vt., has acquired the mill and business of the Contoocook Valley Paper Co., Henniker, Vt. The purchased plant will be continued under the same name with reorganized company, headed by Arthur J. Pierce. Operations will be maintained

at the Henniker mill as an individual unit, and plans for extensions are under consideration.

The Weber Piano Co., Worcester, Mass., operated by the Aeolian Co., 29 West Forty-second Street, New York, will remove a portion of its local works to the plant of the Hallet & Davis Piano Co., Neponset, Mass. The Worcester plant will be developed exclusively to the manufacture of high grade cabinets and special woodworking.

B. Arthur Richards, Winsted, Conn., formerly president of the Benjamin Richards Co., operating a local plant on Lake Street, is said to be at the head of a new organization which will take over the factory, idle for a number of months past, for the manufacture of curtain rods, metal and brass goods, etc. It will be remodeled to accommodate the new industry.

The State Engineering department, Concord, N. H., W. A. Stone, state purchasing agent, has plans for a one-story automobile service, repair and garage building on Stickney Avenue for State-owned motor cars, estimated to cost \$60,000. It is purposed to install a lathe, drill press and other equipment.

The city property committee, Springfield, Mass., is planning for the early purchase of three new steam boiler units and auxiliary equipment for installation in the municipal power house. An appropriation of \$18,000 will be arranged for the work.

The Y. D. Service Garage, Inc., Boston, will proceed with the erection of its proposed eight-story service, repair and garage building on Park Square, by day labor. It will cost more than \$1,750,000 with equipment. Krokyor & Brown, 220 Devonshire Street, are architects.

The Parker Brothers Co., Salem, Mass., manufacturer of toys, games, etc., will proceed with a one-story addition, 90 x 200 ft., for which a general contract has been let to the H. K. Ferguson Co., Cleveland.

The American Brass Co., Waterbury, Conn., has superstructure nearing completion on a three-story addition, 60 x 135 ft., on Jewelry Street, and will have the factory ready for equipment installation at an early date. It will cost about \$80,000.

## St. Louis

ST. LOUIS, Feb. 23.

AN expansion program is being arranged by the Union Electric Light & Power Co., St. Louis, to total about \$10,000,000. The work will include extensions in present power plants, equipment installation and transmission line construction. Louis H. Egan is president.

The Koken Companies, Inc., 2528 Texas Avenue, St. Louis, manufacturer of enameled iron barber chairs and other iron products, has preliminary plans for a new plant consisting of 14 buildings on Morgansford Road. Bids will be asked for the initial structures early in March, others of the group to be erected later. The complete project will cost close to \$2,000,000. William A. Lucas, 1134 Halliday Street, is architect; L. A. Carter, 3536 Chouteau Street, is engineer. W. F. Koken is president.

The J. H. Von Steen Co., Third and Market Streets, Beatrice, Neb., manufacturer of wire fencing and kindred products, has plans under way for a two-story and basement addition to cost \$75,000. It will replace a building destroyed by fire.

The City Council, Seymour, Mo., plans the installation of a pumping plant in connection with a proposed municipal waterworks, for which a bond issue of \$30,000 is being arranged.

The Bolene Refining Co., Enid, Okla., has plans under way for extensions in its oil refinery, with the installation of additional machinery. Improvements will also be made in the present plant. V. E. Bolene is president.

The Arkansas-Missouri Power Co., Blytheville, Ark., is considering enlargements in its ice-manufacturing and cold storage plant, with the installation of considerable equipment. C. H. Rowland is general manager.

The Service Mill & Lumber Co., Tulsa, Okla., will soon begin the erection of a one-story and basement woodworking plant and planing mill, 50 x 125 ft.

The Eagle-Picher Lead Co., 208 South La Salle Street, Chicago, has acquired additional properties in the Waco district, Joplin, Mo., and is reported to be considering the erection of a new mill, to cost in excess of \$200,000 with machinery.

The Board of Education, Pittsburg, Kan., plans the installation of manual training equipment in its proposed two-story Lakeside junior high school estimated to cost \$250,000, for which bids will be asked on a general contract early in March. C. A. Smith, Finance Building, Kansas City, Mo., is architect.

Ovens, power equipment, conveying and other machinery will be installed in the new three-story and basement plant

to be erected by the Continental Baking Co., Home Life Building, Little Rock, Ark., to cost \$200,000 with equipment. C. L. Thompson, Home Life Building, is architect.

The Coleman Lamp Co., 257 North Santa Fe Street, Wichita, Kan., will soon proceed with superstructure for its proposed four-story plant, 80 x 140 ft., to cost \$80,000 with equipment. A general contract was recently awarded to John Denny, 1151 North Lawrence Street. H. A. Noble, Pioneer Trust Building, Kansas City, Mo., is architect. Headquarters are at 3617 South Ashland Avenue, Chicago.

The Huttig Sash & Door Co., 1206 South Vandeventer Avenue, St. Louis, has completed plans for an addition to its branch plant at Jacksonville, Fla., two-stories, to cost \$70,000 with equipment. A. J. Siegle is president.

The Nebraska Electric Power Co., Broken Bow, Neb., will build a 12-mile transmission line between Merna and Anselma.

City Council, Hartington, Neb., is considering plans for a new municipal electric plant. The Diesel Engineering Co., Lincoln, is the engineer.

Contracts will be awarded about April 1, by the Northern Nebraska Power Co., Spencer, Neb., for a dam on Niobrara River and power plant to cost \$500,000 with equipment. A. W. Person, secretary, Fairmont, Neb., is in charge of building operations. The Power Engineering Co., 621 Metropolitan Life Building, Minneapolis, is the consulting engineer.

The Tri-State Driller Co., Baxter Springs, Kan., is in the market for a used 26-in. x 16-ft. engine lathe with taper attachments, motor driven, and also for a used New-Bement-Pond steam hammer of 1500-lb. capacity.

## Milwaukee

MILWAUKEE, Feb. 23.

**S**ENTIMENT in the machine-tool trade continues optimistic, due to the steadily increasing number of inquiries being received, and the fact that the volume of sales is fairly well maintained. The automotive industry is the most prolific source of business, although agricultural machinery builders are becoming an important factor, and hope is expressed that railroad buying will tend to sustain the market against possible declines in other quarters, which is not regarded as likely. There is a fair demand for used equipment, with supply still considerably in excess of current needs.

The city of Milwaukee probably will spend from \$300,000 to \$500,000 in the purchase of machine tools and equipment during the year, the main requirements being for the new municipal service building and for the machine shop of the North Point pumping station. The Central Board of Purchases, Joseph W. Nicholson, chief buyer, is asking bids until Feb. 24 on one 10-ton electric traveling crane. At the same time tenders are being received on two 100 kw. transformers. On March 11 bids will be opened on one 25,000,000-gal. pumping engine of the vertical, triple-expansion, crank and flywheel type. A bond of \$67,500 or certified check for \$33,750 is required with each bid.

The French Battery Co., Madison, Wis., manufacturer of dry batteries, flashlights, etc., has leased for six years, with option to purchase, the plant of 75,000 sq. ft. built during the war by the Four Lakes Ordnance Co., but later dismantled. The French company will install new machinery for manufacturing radio A batteries, flashlight cases and other metal products. Possession will be taken April 1 and it is planned to have the new unit, factory No. 2, in operation by May 1. The No. 1 factory contains 55,000 sq. ft. J. B. Ramsey is president and treasurer.

The Bergstrom Stove Co., Neenah, Wis., plans to undertake work at once on the reconstruction of portions of its foundry and machine shop, damaged about \$25,000 by fire on Feb. 13. Considerable replacement of equipment will be necessary.

The Hudson Mfg. Co., Minneapolis, farm implements, machinery and equipment, which recently announced its intention to abandon its operation at the branch plant in DePere, Wis., due to heavy fire damage last fall, has indicated that it will now rehabilitate these facilities and enter into larger production than before the fire. The change in plans is due to the greatly improved farm market and the promising outlook. The enlargement of the branch plant at Oshkosh, Wis., which embraced absorption of the DePere equipment, will proceed, it is stated. H. D. Hudson is president and general manager.

The A. B. & B. Sheet Metal Works, 3300 Fond du Lac Avenue, Milwaukee, which is letting contracts for a \$35,000 shop addition, has changed its corporate title to Stolper

Steel Products Co., and increased its capital from \$50,000 to \$100,000. Charles Stolper is president, treasurer and general manager.

The Northwestern Refrigerator Car Line Co., 19 South La Salle Street, Chicago, has purchased most of the machinery, but is reported to be in market for electric motors for car shops now being built at Baraboo, Wis.

The Flambeau Paper Co., Park Falls, Wis., E. P. Sherry, president, 461 Jefferson Street, Milwaukee, will build machine shop, carpenter shop and garage to cost \$150,000. Brust & Philipp, 405 Broadway, Milwaukee are the architects.

## Indiana

INDIANAPOLIS, Feb. 23.

**P**LANS have been completed by the American Strawboard Co., Noblesville, Ind., for a one-story addition, 75 x 300 ft., to cost \$45,000 with equipment. The company specializes in the manufacture of corrugated containers and cases, and is a subsidiary of the Ball Brothers Co., Muncie, Ind.

The Indian Refining Co., Lawrenceville, Ill., has plans under way for a one-story storage and distributing plant on East New York Street, Indianapolis, to cost about \$45,000 with equipment. The company is also planning a one-story automobile service, repair and garage building at the same location to cost \$30,000, with tools, etc. Another oil storage and distributing plant is planned at Terre Haute, Ind., to cost \$35,000 with equipment. Col. J. H. Graham is president.

The Merchants Heat & Light Co., Indianapolis, has filed plans for the construction of a one-story meter repair and parts plant with storage and distributing facilities. An automobile service, repair and garage building with capacity of 200 cars, for company motor trucks and automobiles, will be erected at the same location. The entire work will cost \$118,000 with equipment.

The Illinois Glass Co., Alton, Ill., has plans for an addition to its steam power house at Gas City, Ind., to cost approximately \$175,000 with machinery. Jackson & Moreland, 31 St. James Avenue, Boston, are architects and engineers.

The Ruud Mfg. Co., Twenty-ninth and Smallman Streets, Pittsburgh, manufacturer of automatic gas water heaters, etc., has leased the entire building at 124-26 West Vermont Street, Indianapolis, for a new factory branch and distributing plant. Possession will be taken on March 1. V. R. Boyer is local manager.

The Board of Education, Valparaiso, Ind., plans the installation of manual training equipment in its proposed three-story and basement high school, to cost \$300,000, for which bids will be asked at once on a general contract. Perkins, Fellows & Hamilton, Tower Court, Chicago, are architects.

The Board of Directors, St. Edwards Hospital, New Albany, Ind., has plans in progress for a new power house and mechanical laundry to cost \$50,000 with equipment. D. X. Murphy & Brothers, Louisville Trust Building, Louisville, are architects.

The Parts Corporation, 733 Virginia Avenue, Indianapolis, manufacturer of automobile parts and equipment, is taking bids for a one-story addition to cost \$25,000 with equipment. Fermor & Cannon, 21 Virginia Avenue, are architects.

## Pacific Coast

SAN FRANCISCO, Feb. 17.

**W**ORK will begin on a one-story addition to the plant of the Atlas Imperial Engine Co., foot of Nineteenth Street, Oakland, Cal., for which a general contract has been let to H. J. Christensen, 505 Seventeenth Street, Oakland.

The Southern California Iron & Steel Co., Vernon, Los Angeles, has plans for a one-story addition, 64 x 190 ft., with crane runway, 62 x 100 ft., to cost \$45,000.

The addition to be erected by the Hall-Scott Motor Car Co., Fifth and Snyder Streets, Berkeley, Cal., will be used primarily as a machine shop, with department equipped to handle repair work. It is estimated to cost \$50,000.

A. Grady Harrison, Payson, Ariz., has made application for a franchise for the construction and operation of a local light and power plant for general commercial service. The installation is reported to cost \$50,000.

John Jerome, 321 Bush Street, San Francisco, has plans for a two-story automobile service, repair and garage building, to cost \$100,000 with equipment.

Frazier & Co., Stockton, Cal., operating a sheet metal works, are arranging for a new one-story plant at South

San Joaquin and Church Streets, to cost about \$21,000 with equipment. Ralph P. Morrell, Union Building, is architect.

Maynard & Child, Railway Exchange Building, Portland, Ore., commission merchants have plans under way for a three-story and basement cold storage and refrigerating plant at Hood River, Ore., to cost \$100,000 with machinery.

The Great Northern Railway Co., St. Paul, Minn., will begin work in about 90 days on a new hydroelectric power plant on the Foss River, near Scenic, Wash., to develop a capacity of 35,000 hp.

The Atchison, Topeka & Santa Fe Railway Co., Los Angeles, plans the installation of pumping equipment in connection with a proposed water development near **Ash Fork**, Ariz.

The Pacific Coast Paper Co., 545 Mission Street, San Francisco, is arranging for the erection of a new factory branch at Mono and P Streets, Fresno, Cal., with departments for storage, distributing and other service, estimated to cost \$80,000.

The Board of Education, Los Angeles is asking bids on a general contract until March 3 for erection of the proposed Frank Wiggins trade school, to be two-stories, 120 x 250 ft., occupying entire site, with central portion, 97 x 115 ft., 10-stories. It is estimated to cost \$700,000 with equipment. Austin & Ashley, Chamber of Commerce Building, are architects.

The City Council, Aberdeen, Wash., is considering plans for a municipal hydroelectric power house in connection with a proposed water supply development on the Wynoochee River. The entire project is reported to cost \$700,000. S. C. Watkins is city water superintendent.

A. E. Doyle, Worcester Building, Portland, architect, has completed plans for a four-story automobile service, repair and garage building, to be known as the Corbett Garage estimated to cost \$300,000.

## Gulf States

BIRMINGHAM, Feb. 23.

**SABEL & ROTHSCHILD**, 330 West Bay Street, Jacksonville, Fla., have been making inquiries for a veneer lathe with attachments for installation at their local veneer and woodworking mill.

The Alabama Power Co., Birmingham, is disposing of a bond issue of \$5,000,000, a portion of the proceeds to be used for extensions. The company has work under way on a new hydroelectric development of 135,000 hp. at Cherokee Bluffs, Ala. It is expected to have the plant ready for service late in the fall. Thomas W. Martin is president.

The Board of Education, Laurel, Miss., plans the installation of manual training equipment in its proposed two-story high school, estimated to cost \$150,000 with equipment. P. J. Krouse, Meridian, Miss., is architect.

The McComb Veneer Mill, McComb, Miss., is considering the construction of a new wooden box manufacturing plant to cost \$45,000 with machinery.

The West Coast Fertilizer Co., Tampa, Fla., has broken ground for a new one-story plant, 120 x 300 ft., to replace the portion of its works recently destroyed by fire. The new structure will cost close to \$100,000 with machinery. The Austin Co., Cleveland, has the general contract.

The Continental Gas, Light & Power Co., Fort Worth, Tex., has acquired the properties of the Sanderson Ice, Water & Light Co., Sanderson, Tex. Plans are under way for extensions and improvements in the power plant, with the installation of additional equipment.

The Mobile Paper Mills, Inc., Mobile, Ala., has plans under advisement for a new boxboard factory at Crichton, Ala., estimated to cost \$450,000 with machinery. B. H. Mackee is general manager.

F. M. Jacob, College Street, Columbus, Miss., and associates have plans under way for a one-story foundry and machine shop, 25 x 100 ft., and 25 x 150 ft., respectively, to cost \$65,000, of which close to \$40,000 will be expended for machinery. It is expected to make equipment purchases at an early date.

The J. Thomson & Brothers Co., New Orleans, manufacturer of automobile bodies, wagons, etc., is arranging for the erection of a five-story plant on Gravier Street. The first three stories will be used for automobile service, repair and garage operations, and other two floors for automobile body and wagon manufacture. The complete plant is reported to cost \$100,000 with equipment. Moise H. Goldstein, Hibernia Building, is architect.

The Mississippi Power & Light Co., Pine Bluff, Ark., contemplates extensions and improvements in its power house and ice-manufacturing plant at Tunica, Miss., formerly the property of the Planters Oil Mill Co., recently acquired. Additional machinery will be installed.

The United Paper Co., 238 South Franklin Street, Tampa, Fla., has awarded a general contract to Logan Brothers, Citizens' Bank Building, for a new plant, two-stories, 109 x 350 ft., to cost \$200,000, of which close to \$125,000 will be expended for machinery. Louis Wellhouse, Jr., is treasurer.

The Texas Central Power Co., Frost Building, San Antonio, Tex., plans the installation of electric pumping machinery in connection with a proposed water-works at Asherton, Tex., estimated to cost \$40,000. S. M. Udden is general manager.

The Rathbone, Hair & Ridgeway Co., 2248 Laflin Street, Chicago, manufacturer of wooden boxes and cases, has awarded a general contract to James Garber, 151 Minerva Street, Jackson, Miss., for the first unit of its proposed mill at Jackson, where a 5-acre tract was recently acquired, estimated to cost \$100,000 with machinery. Other units will be constructed later. Claude H. Lindsley, Lamar Building, Jackson, is architect. B. F. Masters is president.

The Western Public Service Co., Colorado Springs, Colo., has plans for the construction of a new ice-manufacturing plant at Sour Lake, Tex. The company will also make extensions and improvements in its power properties in this section, including the installation of additional equipment.

R. C. Jones, 1902 South Cumberland Street, Vernon, Tex., contractor, is in the market for hoisting equipment.

The Albright Motor Co., Third Avenue, St. Petersburg, Fla., will erect a one-story plant on Fifth Street, 120 x 200 ft., for automobile truck and tractor assembling, with machine works for general service and repairs to cost \$75,000 with equipment.

The Standard Collapsible Rotary Drill Co., Scanlan Building, Houston, Tex., has been organized by O. M. Carter, inventor, who will make an effort to have the drills manufactured and marketed by some established oil well supply company. If no satisfactory arrangements are made along this line, the capital of the company will be largely increased and manufacturing of the product will be conducted by the Standard Collapsible Rotary Drill Co.

## South Atlantic States

BALTIMORE, Feb. 23.

**HUTCHINSON BROTHERS**, 5 South Howard Street, Baltimore, manufacturers of furnaces and parts, will soon take bids for a one-story machine shop, 32 x 100 ft., to cost \$35,000. C. H. Hebrank, Central Savings Bank Building, is architect.

The Antietam Electric Light & Power Co., Boonsboro, Md., has plans for extensions in its hydroelectric power house, to include the installation of a water turbine, generator set, switchboard and accessory equipment. The company was recently acquired by R. S. Graves, head of the Chagrin Valley Electric Co., Chagrin Falls, Ohio.

Fire, Feb. 11, destroyed a portion of the storage and distributing plant of the Savannah Sugar Refining Corporation, Port Wentworth, Ga., with loss reported at \$100,000 including equipment. It is planned to rebuild. Headquarters are at Savannah.

The J. M. Tull Rubber Co., 150 Marietta Building, Atlanta, Ga., has tentative plans for a new plant to cost \$200,000 including machinery.

The Black & Decker Mfg. Co., Towson, Baltimore, manufacturer of electric drills, etc., is considering the construction of a one-story addition, 100 x 200 ft., to cost \$75,000 with equipment. S. Duncan Black is president.

The Bristol Fixture & Mfg. Co., Bristol, Va., recently organized to manufacture show cases, store fixtures, etc., is completing plans for the establishment of a new factory to cost approximately \$25,000. H. H. Galloway is president.

The Wilson-Hock Co., City Point, Va., machinery dealer, has inquiries out for an electric generator set, 125 kw., 220 volts, d.c., generator direct-connected to Corliss or slide valve engine unit; also for a number of slip-ring motors, 75, 40, 30 and 10 hp., with starting equipment, etc.; one voltage regulator, suitable for use with 400 kw. electric generator, 3-phase, 60-cycle, 220 volts.

The Board of District Commissioners, Washington, plans the installation of manual training equipment in its proposed three-story Randall Junior high school, for which superstructure will soon begin. It will cost about \$300,000. Albert L. Harris and G. W. Harrison, are architect and engineer, respectively, both District Building.

The Mack International Motor Truck Co., 25 Broadway, New York, has preliminary plans for a new factory branch, with service, repair and maintenance departments at Charlotte, N. C., to cost \$85,000 with equipment. R. H. Strickland, West Fourth Street, is local manager.

George Ferguson, Thomasville, Ga., and associates have acquired property on Carroll Hill, and will begin the construction of a new plant for the manufacture of interlocking cement tile blocks and kindred cast concrete products. The initial works will be equipped for a capacity of about 1000 blocks per day.

The Garden King Tractor Co., 1327 Main Street, Pittsburgh, George L. Mazer, head, has concluded negotiations with the town officials at Stoneville, N. C., for the erection of a local plant for the manufacture of farm tractors, parts and kindred equipment. A site has been donated and work will soon begin on a one-story factory, 50 x 100 ft.

The R. S. Armstrong & Brother Co., 676 Marietta Street, Atlanta, Ga., machinery dealer, has inquiries out for an electric hoist, about 75-hp. capacity, three-drum type.

The Newton Furniture Co., Inc., Newton, N. C., has awarded a general contract to Setzer Brothers, Newton, for four one-story additions, 60 x 200 ft., estimated to cost \$65,000, with equipment. The majority of equipment will be electrically operated. The company is planning the early purchase of wood-working and other machinery. Fred Horton, Newton, is architect.

The Luray Power Co., Luray, Va., has been acquired by new interests, headed by Col. Ira Vaughn, 240 West Susquehanna Street, Philadelphia. The company operates power plants at Chatham, Halifax, South Boston, Chase City, and other points in Virginia. The new owners have preliminary plans for extensions, including transmission line construction.

R. P. Johnson, Wytheville, Va., machinery dealer, has inquiries out for a crusher with elevator and screen, etc., No. 4½ Champion type preferred; also for flour mill equipment for a plant to develop an output of about 25 bbl. per day; and one horizontal return tubular boiler, 60 in. diameter and 16 ft. long, to operate at 125 lb. pressure.

John M. Berry and E. P. Grant, Rome, Ga., are organizing a company with capital of \$100,000, to construct and operate a local foundry for the production of iron castings. The initial plant is estimated to cost \$40,000 with equipment.

The United States Engineer, Savannah, Ga., is asking bids until March 1 for one motor-driven, single stage air compressor, circular 176.

The Board of Education, College Park, Ga., is considering the installation of manual training equipment in a proposed new high school to cost \$175,000, for which tentative plans are being prepared by William J. J. Chase, 140 Peachtree Street, Atlanta, Ga., architect.

C. M. and Calvin White, Manning, S. C., operating a local sawmill, are considering plans for the establishment of a cabinet and wood-working plant for the manufacture of caskets and other products.

The Atlantic Machine Works, Inc., 123 West Twenty-fifth Street, Norfolk, Va., is desirous of getting in touch with a foundry in the vicinity of the city for the production of malleable iron castings.

The Cooper River Ferry Commission, Charleston County, Charleston, S. C., has asked bids until March 31 for bridge-lifting equipment to be installed on a new double deck ferry terminal, now in course of erection. The Dawson Engineering Co., Inc., 21 Broad Street, Charleston, is engineer.

The Standard Soapstone Corporation, Arrington, Va., is in the market for four used Sullivan or Ingersoll horizontal channellers, three undercutters and one Sullivan Class M core drill.

The firm of Trimble & Fink, 927 Linden Avenue, Baltimore, manufacturer of screw drivers, has been incorporated as the Trimble & Fink Mfg. Co., with capital stock of \$100,000 preferred and \$50,000 common. The company will soon be in the market for some additional machinery and may possibly consider the erection of a plant to provide for future expansions.

## Canada

TORONTO, Feb. 23.

INQUIRIES and sales of machine tools in this market cover a wide field. The automotive industry is the principal buyer at present and several small lists have recently appeared from machine-tool plants from various sections of the country. Mining tools also are in strong demand. The placing of orders by Canadian railroads is expected to have an indirect bearing on the tool market, as it is believed that plants turning out cars and locomotives will find it necessary to add to their equipment. Demand for second hand tools shows improvement.

Ronald Harrison, Birch Cliff, Ont., works superintendent, has recommended the installation of a new unit in the waterworks plant capable of pumping 1000 gal. per min., and the purchase of a 100-hp. motor for the pumping station.

The Water Commission, Windsor, Ont., proposes to install a new steam emergency pump which will necessitate enlarging the pumping station. Frank J. Mitchell, mayor, is interested.

Plans are under way for the erection of work shops at Limoliou, Que., for the Quebec Power Co., Quebec, to cost \$400,000. According to president, Julian C. Smith, construction will be started during the summer.

It is reported that the Anglo-Canadian Pulp & Paper Co., Quebec, will start work on the erection of its mill early in May.

### Western Canada

The Capilano Timber Co., Vancouver, B. C., proposes to start work soon on the construction of a mill to cost \$1,000,000. G. G. Johnson is general manager.

Commissioner Freeman, Lethbridge, Alta., has recommended to the City Council that a 1400 gal. centrifugal pump be purchased at a cost of \$7,500.

## Foreign

THE Curacao Electric Light Co., Curacao, West Indies, has plans for an addition to its power house, including the installation of a new generating unit and auxiliary apparatus. S. E. L. Maduro, Selma Mercantile Corporation, 16 Moore Street, New York, is interested in the project and will make equipment purchases.

The American Chamber of Commerce in France, 32 Rue Taitbout, Paris, has received an inquiry (B-3249) from a company in Alsace desiring to get in touch with American manufacturers of hardware and kitchen utensils.

The American-Belgian Chamber of Commerce in Belgium, 48 Rue de Naples, Brussels, Belgium, has received an inquiry (Reference 252) from a company in Belgium desiring to get in touch with American manufacturers of lorries, automobile products and accessories.

The Government of the State of Kathiawar, India, has authorized the construction of a new alkali and salt by-products plant at Dharangadra. A large investment will be made for machinery and general operating equipment. It is expected to complete the plant in about 18 months. The American Consulate, Bombay, India, C. T. Everett, vice-consul, has information regarding the project.

The Ministry of Public Works, Prague, Czechoslovakia, is arranging a construction program for 1926, covering the building of a new hydroelectric power plant and power dam at Uzhorod, and the installation of equipment and completion of hydroelectric power projects at Kolin, Nymburk, Prelouc and Mirejovice. An appropriation of about \$750,000 has been authorized for this work. The American Consulate, Prague, C. E. Wlnans, consul general, has information regarding the projects.

A. Parma, Poste Turque Centrale Boite 112, Constantinople, Turkey, is desirous of getting in touch with American manufacturers of tin, tin plate, corrugated sheets and galvanized plain sheets.

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# Current Metal Prices

On Small Lots, Delivered from Stocks, New York

THESE prices are given for the convenience of small-lot buyers whose requirements do not run into mill-size orders.

Only base prices can be listed in some cases, due to limits of space; other items of a given group are deducible from the base price.

The prices which are quoted below are those at which small lots may be bought, whether from jobbers' or other stocks.

Complete market reports and prices on large shipments from mills will be found elsewhere under "Iron and Steel Markets" and "Non-Ferrous Metals."

Bars, Shapes and Plates		Per Lb.
Bars:		
Refined iron bars, base price	3.24c.	
Swedish charcoal iron bars, base	7.00c. to 7.25c.	
Soft steel bars, base price	3.14c. to 3.24c.	
Hoops, base price	4.49c.	
Bands, base price	3.99c.	
Beams and channels, angles and tees, 3 in. x $\frac{1}{4}$ in. and larger, base	3.24c. to 3.34c.	
Channels, angles and tees under 3 in. x $\frac{1}{4}$ in. base	3.14c. to 3.24c.	
Steel plates, $\frac{1}{4}$ in. and heavier	3.24c. to 3.34c.	

Merchant Steel		Per Lb.
Tire, $1\frac{1}{2}$ x $\frac{1}{2}$ in. and larger	3.30c.	
(Smooth finish, 1 to $2\frac{1}{2}$ x $\frac{1}{4}$ in. and larger)	3.65c.	
Toe-calk, $\frac{1}{2}$ x $\frac{1}{8}$ in. and larger	4.20c.	
Cold-rolled strip, soft and quarter hard	6.25c.	
Open-hearth spring steel	4.50c. to 7.00c.	
Shafting and Screw Stock:		
Rounds and hex.	4.00c. to 5.00c.	
Squares and flats	4.50c. to 5.50c.	
Standard tool steel, base price	12.00c.	
Extra tool steel	15.00c. to 18.00c.	
Special tool steel	20.00c. to 23.00c.	
High-speed steel, 18 per cent tungsten	70c.	

Sheets		Per Lb.
Blue Annealed		
No. 10	3.89c.	
No. 12	3.94c.	
No. 14	3.99c.	
No. 16	4.09c.	

Box Annealed—Black		Per Lb.
Soft Steel		
C. R. One Pass	Long Terne Sheets	
Per Lb.	Per Lb.	
Nos. 18 to 20	4.30c.	5.75c.
Nos. 22 and 24	4.35c.	5.90c.
No. 26	4.40c.	6.05c.
No. 28*	4.50c.	6.35c.
No. 30	4.70c.	6.85c.

Galvanized		Per Lb.
No. 14	4.60c.	
No. 16	4.75c.	
Nos. 18 and 20	4.90c.	
Nos. 22 and 24	5.05c.	
No. 26	5.20c.	
No. 28*	5.50c.	
No. 30	6.00c.	

\*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

Welded Pipe		Per Lb.
Standard Steel		
Black Galv.	Black Galv.	
$\frac{1}{2}$ in. Butt	46	29
$\frac{3}{4}$ in. Butt	51	37
1-3 in. Butt	53	39
2 $\frac{1}{2}$ -6 in. Lap	48	35
7 & 8 in. Lap	44	17
11 & 12 in. Lap	37	12
Bolts and Screws		

Machine bolts, cut thread, 40 and 10 per cent off list  
Carriage bolts, cut thread, 30 and 10 per cent off list  
Coach screws, 40 and 10 per cent off list

Wood screws, flat head iron, 77 $\frac{1}{2}$ , 20, 10, 10 and 10 per cent off list

Steel Wire

BASE PRICE† ON NO. 9 GAGE AND COARSER		Per Lb.
Bright, basic	4.25c.	
Annealed, soft	4.50c.	
Galvanized, annealed	5.15c.	
Coppered, basic	5.15c.	
Tinned, soft Bessemer	6.15c.	

†Regular extras for lighter gage.

Brass Sheet, Rod, Tube and Wire		BASE PRICE
High brass sheet		19 $\frac{1}{2}$ c. to 20 $\frac{1}{2}$ c.
High brass wire		19 $\frac{1}{2}$ c. to 20 $\frac{1}{2}$ c.
Brass rods		16 $\frac{1}{2}$ c. to 17 $\frac{1}{2}$ c.
Brass tube, brazed		27 $\frac{1}{2}$ c. to 28 $\frac{1}{2}$ c.
Brass tube, seamless		23 $\frac{1}{2}$ c. to 24 $\frac{1}{2}$ c.
Copper tube, seamless		24 $\frac{1}{2}$ c. to 25 $\frac{1}{2}$ c.

Copper Sheets		base
Sheet copper, hot rolled	22 $\frac{1}{2}$ c. to 23 $\frac{1}{2}$ c.	per lb.

Cold rolled, 14 oz. and heavier, 3c. per lb. advance over hot rolled.

Tin Plates		COKE—14x20	PRIME	SECONDS
Bright Tin	Grade "AAA"	80 lb.	\$6.15	\$5.90
	Grade "A"	90 lb.	6.30	6.05
	Charcoal	14x20	100 lb.	6.45
			IC.	6.65
			IX.	7.85
			IXX.	9.00
			IXXX.	10.35
			IXXXX.	11.35

Terne Plates		14 x 20
IC—8-lb. coating		\$7.75 to \$8.00
IC—20-lb. coating		10.00 to 11.00
IC—30-lb. coating		12.00 to 13.00
IC—40-lb. coating		13.75 to 14.25
Fire-door stock		10.50

Tin		
Straits, pig		.66c. to 66 $\frac{1}{2}$ c.
Bar		.69c. to 69 $\frac{1}{2}$ c.

Copper		
Lake ingot		15 $\frac{1}{2}$ c.
Electrolytic		15 $\frac{1}{4}$ c.
Casting		15 c.

Spelter and Sheet Zinc		
Western spelter		8 $\frac{1}{4}$ c. to 9c.
Sheet zinc, No. 9 base, casks		13 $\frac{1}{4}$ c.; open, 13 $\frac{3}{4}$ c.

Lead and Solder*		
American pig lead		10c. to 11c.
Bar lead		12c. to 13c.
Solder, $\frac{1}{2}$ and $\frac{1}{2}$ guaranteed		41 c.
No. 1 solder		40 c.
Refined solder		33 $\frac{1}{2}$ c.

\*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal		
Best grade, per lb.		68c. to 72c.
Commercial grade, per lb.		30c. to 35c.

Antimony		
Asiatic		23 $\frac{1}{2}$ c. to 25 $\frac{1}{2}$ c.

Aluminum		
No. 1 aluminum (guaranteed over 99 per cent pure), ingots for remelting, per lb.		30c. to 30 $\frac{1}{2}$ c.

Old Metals		
The market is strong and values are firm. Dealers' buying prices are as follows:		

	Per Lb.	Cents
Copper, heavy crucible		12.25
Copper, heavy wire		12.00
Copper, light bottoms		9.75
Brass, heavy		7.25
Brass, light		6.25
Heavy machine composition		9.00
No. 1 yellow brass turnings		8.50
No. 1 red brass or composition turnings		8.00
Lead, heavy		8.00
Lead, tea		6.00
Zinc		4.50
Cast aluminum		18.50
Sheet aluminum		18.50